

JUNE 24, 1961

Chemical Week

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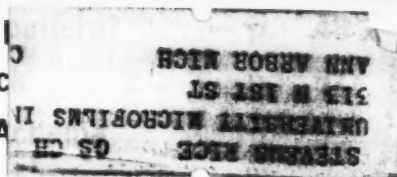


Steel Warms CPI Outlook—Special Report p. 111

Polypropylene reseller tie-ups: new plastics marketing

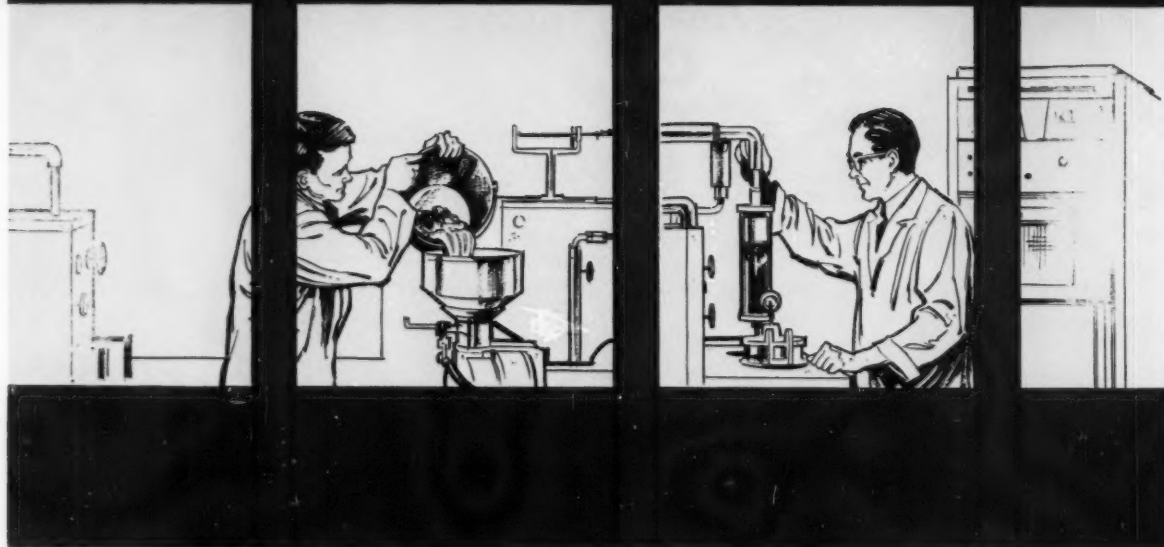
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June 24, 1961 CHEMICAL WEEK 1

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ON THE COVER: The steel industry—represented here in photo and painting of the Youngstown Sheet & Tube Co.'s operations—is a big factor in the upswing of chemical business (p. 111).



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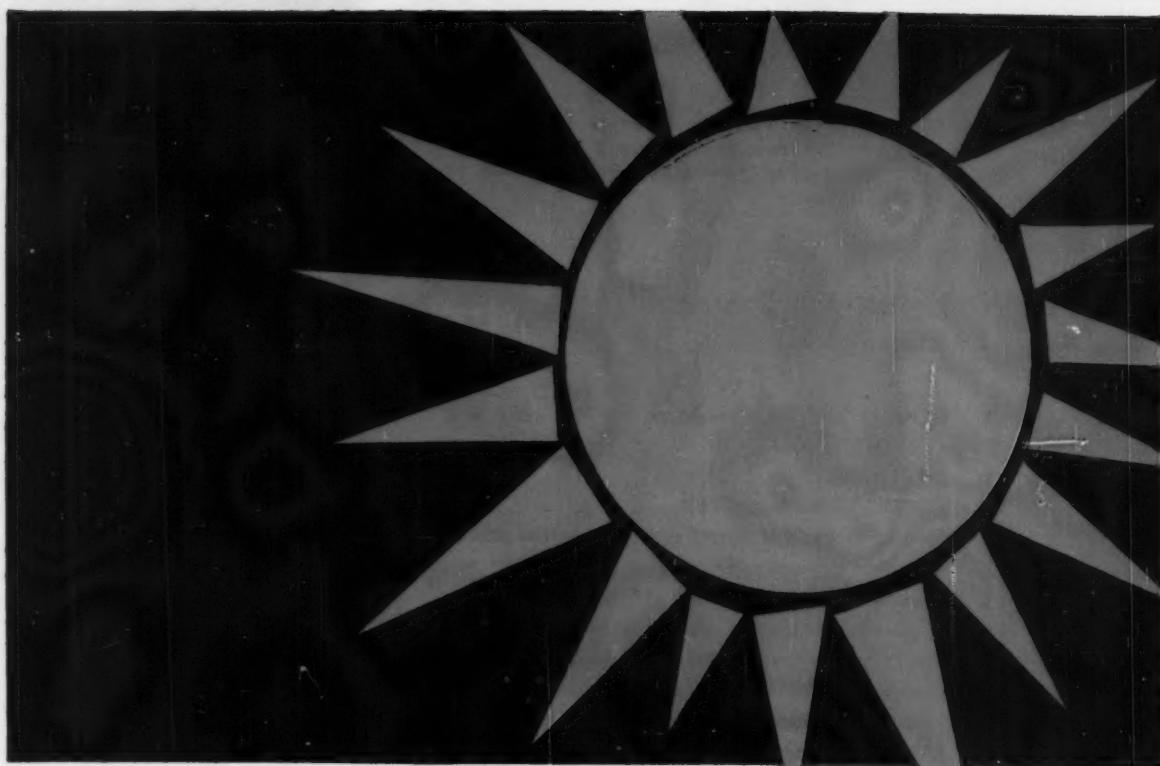
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MIBK	186
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n-Butyl Acetate	100
Xylol	69
Cellosolve	38
Isophorone	4.3

Flash Points (*F Tag Open Cup) of 2-NP Compared to Other Solvents

Acetone	16
MEK	30
Toluol	56
MIBK	81
Xylol	85
n-Butyl Acetate	92
2-NP	103
Cellosolve	126
Isophorone	202

Comparison of Lower Limit of Flammability of 2-NP With Other Solvents (% by volume in air)

MIBK	0.9
Xylol	1.0
Toluol	1.27
n-Butyl Acetate	1.7
MEK	1.8
Acetone	2.15
2-Nitropropane	2.6
Cellosolve	2.6



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Achema 1961: Big and Busy

The following are observations of Chemical Week Editor-in-Chief Howard C. E. Johnson, now in Germany. For full Achema coverage, see p. 133.

Frankfurt, West Germany (June 14): Trying to describe the European Convention of Chemical Engineering, which took place here last week, reminds one of the story of three blind men trying to describe an elephant. One felt its trunk and said it was a thick rope; another felt its sides and decided it was a huge wall; the third felt its leg and concluded that it was a massive column. The many aspects of the exhibition-congress are so varied that it is equally difficult to put them into proper focus. The sheer size of the exhibition was stupefying. The 1,388 exhibiting firms from 17 countries spread \$18 million worth of their wares over 20 acres of space in 24 halls and four outdoor areas. Even allowing for aisles and roads, there were over 12 acres of exhibits.

Hotels were jammed and many visitors were put up in private homes. There were over 8,000 registrants manning booths, 600 press representatives and an estimated 100,000 visitors.

Never in its 31-year history had Achema been held under more favorable circumstances. Fluttering over the windy and rainswept fairgrounds, the bright-colored optimism engendered by Western Europe's rapid industrial growth and prosperity. Instead of having people looking for jobs, West Germany has hundreds of thousands of jobs looking for people to fill them.

Even though the bright flags and the many quick-lunch spots may have suggested a carnival atmosphere, at the booths it was all business. Visitors were taking copious notes, inspecting the displays, talking earnestly with the booth attendants.

Aside from the equipment and technology they saw, Americans and Europeans could learn much from one another. Each Achema registrant, for example, was given a 566-page handbook, which, with typical German thoroughness, listed in four languages over 7,000 items of equipment with the appropriate booth numbers. Moreover, most booths had telephones for quick handling of inquiries. Neither was education neglected: a week-long study course consisting of lectures and tours of the exhibits guided by volunteer engineering specialists was arranged for groups of science and engineering students. But American visitors missed a central registry, such as is found at a national ACS meeting, from which they could learn who was there and where to reach them. Also, for good or ill, they missed the entertaining crowd-stopping gimmicks in which American trade shows abound.

Moreover, reporters and editors used to American ways, were frustrated by the typical reticence toward the press. American conventions almost invariably have a commodious press room, usually equipped with typewriters and providing every reasonable means for gathering news and information.

But such minor difficulties are simple occupational hazards. They shouldn't be permitted to blind one to the fact that Achema was an impressive demonstration of West German industrial vitality, a vitality that is comforting to feel and see in a world faced with a burgeoning technology in the Communist countries to the east.

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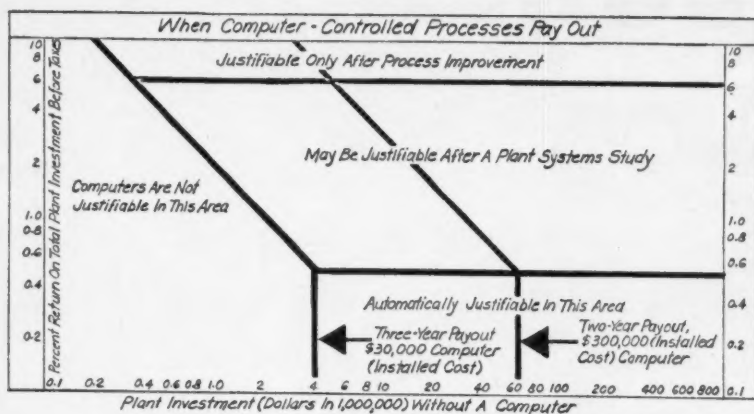
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Computer Payout

TO THE EDITOR: The article "Fleshing Out Automation's Roster" (May 27, p. 59) contains a figure (p. 60) that you attribute to Monsanto Chemical Co.

The figure is evidently a composite of two separate figures from a previous article ("Studying the Economics of Process Computer Control," *ISA Journal*, Vol. 8, No. 1, pp. 50-59, Jan. 1961, by T. J. Williams). If such is the case the figure as presented contains several errors.

We are enclosing a corrected version of your figure as derived from the previously published work (see illustration above).

Note that the legend of the abscissa should read "... (dollars in 1,000,000) ...", rather than "... (dollars in 100,000) ...".

Please note also that the legends on the two arrows designating the two different-size computer systems have been reversed.

THEODORE J. WILLIAMS
Monsanto Chemical Co.
Research and Engineering
Division
St. Louis, Mo.

IFC Is Independent

TO THE EDITOR: We appreciate the mention of International Finance Corp. (April 1, p. 62). However, being listed along with federal agencies may give a mistaken impression to the reader who is not familiar with our operations.

IFC is an independent international organization closely affiliated

with the World Bank. We have 59 member countries.

IFC was created for the purpose of helping private capital industrial operations in any of our less-developed member countries. Stimulation of local productive private capital activities in these countries is just as important to our purposes as encouragement to U.S. investors.

Our investments are exclusively on a private capital basis without any government or other guarantee. . . .

SCOTT SEEGER
Press Officer
International Finance Corp.
Washington, D. C.

British Polystyrene

TO THE EDITORS: "Getting More From Oil" (April 29, p. 25) is a most concise and timely article on the petrochemical activities in Great Britain.

In the last paragraph of this item you mention the destinations of the styrene monomer — for conversion into polystyrene—from Forth Chemicals, Ltd.'s new plant at Baglan Bay. Conspicuous by its absence is Monsanto Chemicals, Ltd., one of the earliest and largest producers of polystyrenes in the United Kingdom. This company is a large factor in this market and has recently brought on-stream two new units, one for impact materials and one for foamable grade. . . .

P. H. AVON
Director of Overseas Manufacture
Monsanto Chemical Co.
Plastics Division
Springfield, Mass.

Sprayon Not Retailing

TO THE EDITOR: We would appreciate a . . . correction of the statement (April 29, p. 76) to the effect that Sprayon Products retails a line of aerosol paints. This statement . . . jeopardizes our relationship with scores of paint manufacturers and merchandisers whom we are supplying, partly based on the understanding that we are not competing with them on the retail market.

Our company does retail a Freon-powdered spray gun, and we do market a line of industrial-user aerosol paints and specialties through mill supply houses. . . .

WILLIAM MOONAN
Vice-President, Sales
Sprayon Products, Inc.
Cleveland, O.

Solids Pelletizing

TO THE EDITOR: Re your very interesting article describing details of the Allis Chalmers compacting process, titled "More Pressure, Fewer Fines" (CW, April 22, p. 51).

I found the article to be very informative as a description of another method of agglomeration that has its place along with briquetting, extrusion, granulation, and disc pelletizing. I was especially pleased with the objective picture that was given of the other methods and of the relative place of various processes. . . .

The article makes reference to balling drums and pans . . . having a limitation as to a carefully prepared material size. While it is true that certain materials cannot be pelletized because of their lack of sufficient fines, the limitation indicated as 80% of feed minus 200 mesh does not apply. Many fines of chemical, clay, ferti-

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



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LETTERS

lizer, ceramic, metallic or nonmetallic minerals have been successfully pelletized on discs with a minimum of 20-25% minus 200 mesh fines—even less if a water-soluble component is included.

WILLIAM H. ENGELLEITNER
Dravo Corp.
Pittsburgh, Pa.

Propylene Dimer Pyrolysis

TO THE EDITOR: I read with keen interest the article (*May 6, p. 73*) featuring the isoprene process developed by Goodyear.

In connection with this process I should like to call your attention to U. S. Patent 2,404,056. This patent was assigned to the Socony Vacuum Oil Co. and resulted from work done by Everett Gorin and the writer at the Field Research Laboratories of the Magnolia Petroleum Co. in Dallas, Tex., during '44.

The process of this patent describes the dimerization of propylene, the selection of a proper cut of the dimer, which, because of the nature of the polymerization catalyst, is predominantly *beta*-olefin, and subsequent pyrolysis of the selected cut to yield isoprene. It was found that approximately 50% yield (mol basis) of isoprene was obtained and that the C₅ fraction after distillation was about 95% isoprene.

The Goodyear process is basically similar to the process described, but does claim somewhat better over-all yields through process improvements.

ALEX G. OBLAD
Vice-President
Research and Development
The M. W. Kellogg Co.
New York

Enameled Appliances

TO THE EDITOR: We have read "Push in Porcelain Enamel" (*May 13, p. 39*) with considerable interest. Your staff is to be commended for its penetrating analysis.

However, there are some things unsaid . . . as far as the appliance industry drop-off in tonnage is concerned. While competitive materials such as stainless steel, plastics and paints have made some inroads, our major tonnage losses have occurred during the years from our industry's own improvements in thinner porce-

lain enamel coats, greater usage efficiency in the plants and the growing trends to one-coat processes. Thus, in one sense, we have been our own worst enemy in reducing through research and development the amount of our product used.

Of course such things as built-in ranges (less exposed area), loss of refrigerators to paint (only one manufacturer offers a p/e model at present), increased availability of stainless-steel sinks (more manufacturers without porcelain enameling facilities)—all have taken some toll.

On the other hand, glass (p/e)-lined water heaters have supplanted almost 100% the galvanized type of 10 years ago. Increasing usage of p/c on laundry equipment (washers, dryers, dishwashers) has made inroads on paints. Even refrigerators—excluding the exteriors—use more porcelain enamel than several years ago because of the larger sizes—70% are now 12 cu.ft. and over; in addition, the so-called crisper and meat-keeper pans, which briefly went to plastics, are back in the p/e family because of the cleanliness and odor-free characteristics of the finish.

All in all, while we are very cognizant of usage of competitive materials in the appliance industry, we aren't sure of the loss trend in that area, as your article seems to imply. . . .

JOHN R. MCCORD
Director, Marketing
Ferro Corp.
Cleveland, O.

Industry's Own FEPC?

TO THE EDITOR: With respect to the article "Dixie Beckons the CPI" (*May 20, p. 69*), I can appreciate the South's need and desire for new industry. But I really wonder how badly the South wants this new industry. Enough to accord full citizenship to all its people, white or black? In view of the recent happenings in Birmingham and Montgomery, it does not appear so.

How can any industry that has any regard for human dignity and civil rights build facilities in a section of the country that has openly defied the federal government and which maintains an archaic, unchristian practice (segregation) that destroys United States prestige abroad?

Business concerns being wooed by groups like HIEC should say, "We'll build in the South on one condition: that full citizenship and freedom be accorded any Negroes we might hire." For business to do less is to place money values over human values, a sin that is increasingly disqualifying us as the leader of the Western world.

WILLIAM P. COOKE
Newark, Del.

American Rubber's Plant

TO THE EDITOR: Your article titled "Rubber Race Heats Up" (*May 27, p. 21*) is an interesting summary of new developments in the field of synthetic rubbers.

One of the tables in the article, listing the companies and the types of stereorubbers they plan to produce and plant capacities, contains an error. American Rubber and Chemical, not American Synthetic Rubber, is building a 30,000-long tons/year polybutadiene-polyisoprene plant at Louisville, Ky. This plant, to be completed in Sept. '61 is expandable to 50,000 tons/year.

American Rubber and Chemical is a joint venture formed by American Synthetic Rubber Corp. and Stauffer Chemical Co., which each own 50%.

American Rubber and Chemical's polybutadiene-polyisoprene pilot plant, also located at Louisville, is now in full operation. Currently it is producing only polybutadiene to supply development quantities of polymer for customers' evaluation.

ARCHIE E. ALBRIGHT
Vice-President-Administration
Stauffer Chemical Co.
New York

Boost Exports

TO THE EDITOR: In view of the tremendous drive on increasing exports started under the last Administration and continued with even added force under the present Administration, your recent article "Ahead: Import-Export Shift" (*April 15, p. 39*) is not only somewhat discouraging but in tenor also might be somewhat misleading.

As far as I can determine, chemical exports have increased every year since '47—my records do not go farther back than that—so to expect

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Kiln Operators with
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For air pollution control, and for solids recovery from kiln gases, the S-F Venturi scrubber's unique design assures reliable performance without maintenance problems. The Chemico S-F scrubber was specifically designed to permit the recycle of slurries with high solids content. It has no nozzles, trays or jets to plug, and it completely eliminates build-up at the gas inlet.

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LETTERS

the increase to continue at the same percentage rate or better is perhaps to expect too much and can serve only to give an erroneous picture of foreign trade.

While I realize figures can be manipulated to prove practically any point, the fact that chemical exports in '60 amounted to 8.68% of the total U.S. exports is definitely an encouraging sign, particularly when the total exports themselves were quite high. The fact that chemical exports amounted to only 6.1% of total chemical sales is important only if it acts as an incentive to increase such export sales. . . .

With regard to imports, these amount to about one-third of our exports. If they were to drop much below this level it would make it more and more difficult for our foreign friends to purchase our chemicals. If, however, our imports were to increase I feel sure that exports would show a similar increase.

We have not in the past been considered a particularly large exporting country. Even today, when in total dollar volume the U.S. ranks first as an exporter, we rank last in exports percentage-wise, compared with other leading exporting nations with reference to gross national production. But again this is important only if it serves . . . as an incentive for further efforts.

The large chemical companies are making those efforts. It would be very worthwhile if some of the smaller chemical companies were to consider very seriously attempting to expand their export business.

E. ROSENDAHL
Executive Vice-President
Bennett-Rosendahl Co., Inc.
New York

Dust-Free LiOH

TO THE EDITOR: We have noted with satisfaction your reference to the use of lithium hydroxide in submarines (*Washington Newsletter*, April 15). We might add that it has been used in space capsules also.

This special form of anhydrous lithium hydroxide was developed by the personnel of the Naval Research Laboratory, as you state. Maywood Chemical Works (now a division of Stepan Chemical Co.) has cooperated in this development from the very beginning, and especially in the

more recent design of the special canisters.

Anhydrous lithium hydroxide . . . ordinarily . . . has a tendency to be dusty, and the caustic dust is extremely irritating. Maywood . . . processes lithium hydroxide to produce a dust-free, very hard, but porous granule. This product is capable of absorbing a higher proportion of CO₂ to its own weight than other CO₂ absorbents, and does so without forming a pasty mass resulting from absorbed water or water of reaction.

LEONARD W. STEIGER
Technical Coordinator
Maywood Chemical Works
Division of Stepan Chemical Co.
Maywood, N. J.

Dominating Patent

TO THE EDITOR: In your timely article, "Eyeing a Breakthrough in Borohydride?" (*June 10*, p. 63), no mention was made that Metal Hydrides owns the dominating U.S. patent No. 2,683,721 in this field.

Claim 1 of this patent is illustrative of its broad scope, and reads in part as follows: "1. In the reduction of a chemical compound containing a reducible functional group including an atom other than hydrogen and carbon, the step which comprises associating the compound with an alkali metal borohydride at a temperature sufficient to cause a chemical reaction . . ."

L. W. DAVIS
President
Metal Hydrides Inc.
Beverly, Mass.

MEETINGS

Gordon Research Conferences, June 26-30; Colby Junior College, New London, N.H.—nuclear chemistry; New Hampton School, New Hampton, N.H.—proteins; Kimball Union Academy, Meriden, N.H.—physical metallurgy; Tilton School, Tilton, N.H.—ion exchange.

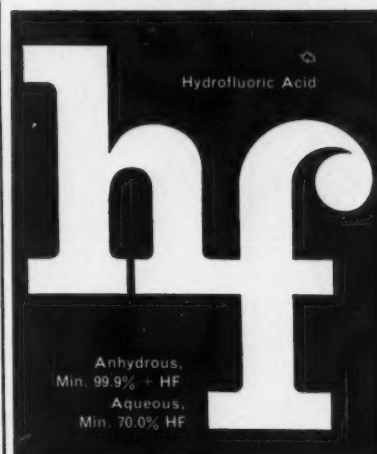
American Society for Testing Materials, 64th annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., June 25-30.

Instrument Society of America, automatic-control conference, Penn Sheraton Hotel, Pittsburgh, Pa., June 28.

Instrument Society of America, second joint automatic control conference, University of Colorado, Boulder, Colo., June 28-30.

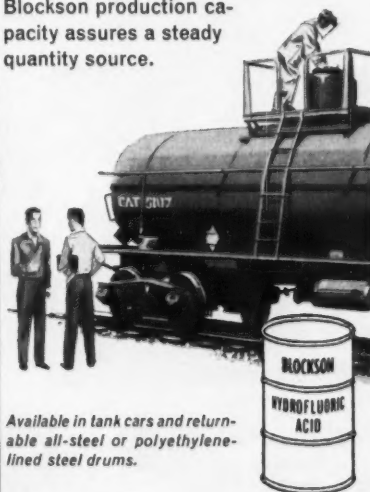
18th International Congress of Pure and Applied Chemistry, Montreal, Can., Aug. 6-12.

BLOCKSON MAKES



and plenty of it

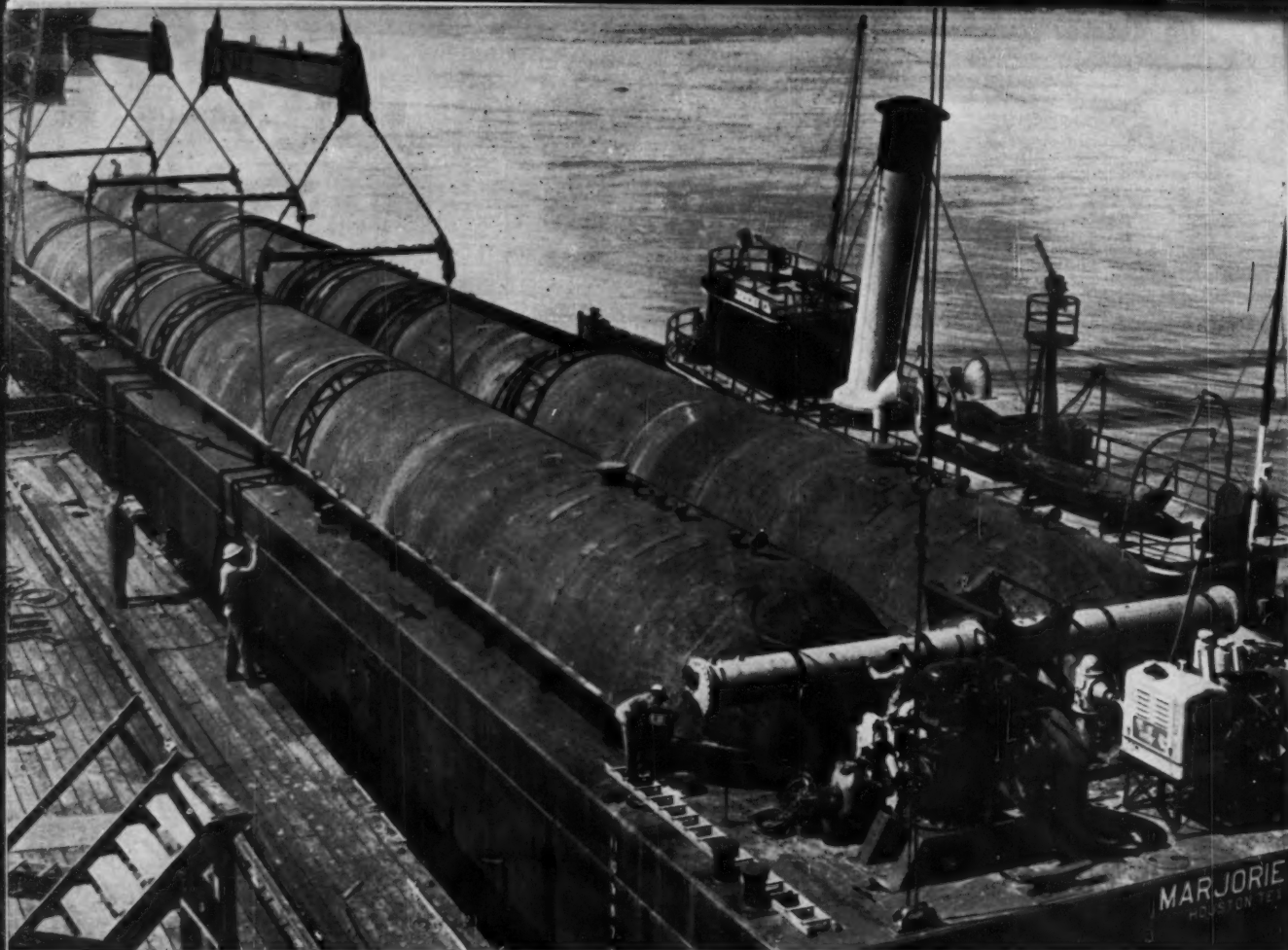
Blockson is one of the fastest growing HF producers. That's because we give HF users the same quick dependable service we give phosphate users—PLUS any help you need in planning, safe handling, storage and piping. Blockson production capacity assures a steady quantity source.



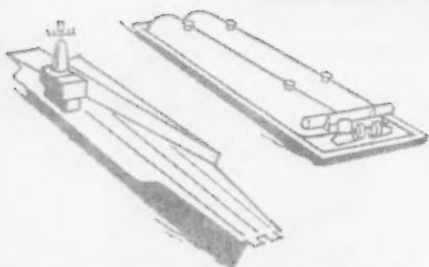
Available in tank cars and returnable all-steel or polyethylene-lined steel drums.

Olin
CHEMICALS DIVISION

Blockson Chemicals • Olin Mathieson
Chemical Corporation • Patterson Road
Joliet, Illinois



Avondale 600-ton lift lowers 242' O.A. by 16' O.D. tank into position on Phillips Petroleum Company barge. This unit, one of two refrigerated propane-ammonia barges building for Phillips Petroleum, are the largest tank carriers yet to be constructed for the chemical or petrochemical industry for this type service. The heavily insulated tanks will carry 1700 tons of anhydrous ammonia, refrigerated to minus 28 degrees F., by equipment installed on the barge.



AVONDALE BARGES SUPER CARRIERS WITH A DIFFERENT MISSION



This liquid chlorine carrier was built by Avondale for Monsanto Chemical Co. and measures 195' x 35' x 11'. It contains six tanks, each 8'8" O.D. x 70'0" in length. The capacity of this barge loaded is 900 tons of liquid chlorine.



Liquid chlorine is being transported by this 175' x 26' x 11' cargo barge for the Diamond Alkali Company. Four independent tanks were mounted on saddles and retained by adjustable 3" x 1/4" flatbar straps.



Hull of Phillips Petroleum barge ready for launching at Main Yard. Hopper design accepts two saddle-mounted tanks. The lead barge measures 305' x 44' x 12'6", the trailing barge 284' x 44' x 12'6". The pair are designed to be handled either independently or as an integrated tow.

Spread on these pages you will see a portion of the ever-increasing Avondale-built barge fleet—*carriers with a different mission*. They're big, they're specialized—they're *super carriers*—custom-built for the chemical and petrochemical industries.

Avondale is admirably suited for complete responsibility in this type construction. Fabricating facilities include the largest and most progressive shipyard on the lower Mississippi, a complete foundry, and the finest technical know-how in the business.

Our best references include a long list of the most-respected names in the chemical and petrochemical industries.

We would welcome the opportunity to quote *your* company in regard to its specialized barge requirements.



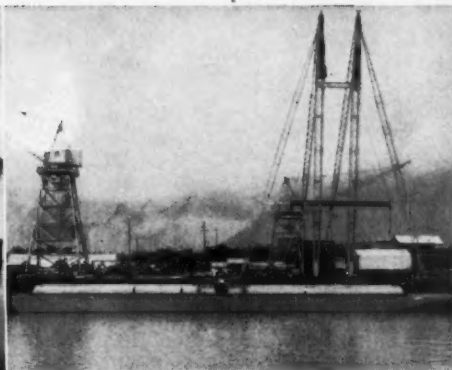
Largest cold steel plate roll of its kind in the Gulf South. This Bertsch roll in the Tank Shop has a capacity of 4½".



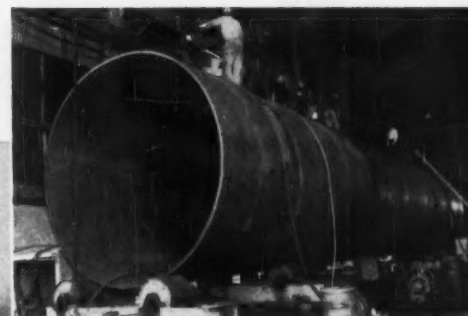
Specialized tank fabricating facilities. Foreground; tank nearing completion on aligning platten, left background; tank being stress relieved in Avondale 18' x 18' unlimited length stress-relieving furnace.



In service for a chemical transporting company. Liquid caustic soda tank barge. Capacity 1682 tons. Size: 205' x 40' x 11'.

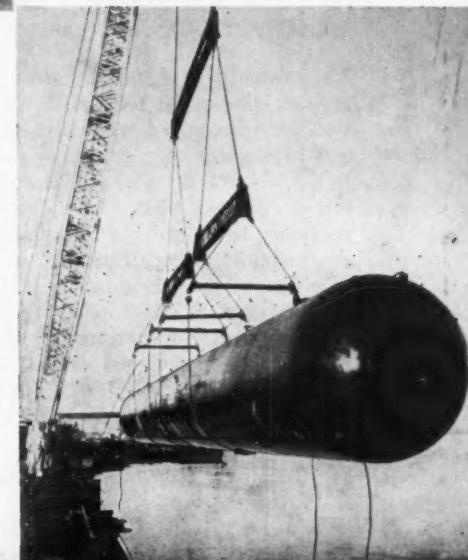


One of two independent pressure tank barges completed for Union Texas Natural Gas Corporation. Each barge measures 273' x 41' x 12'6". Each barge contains four cargo tanks 112' in length, each tank with a capacity of 165,000 gallons, for a total barge capacity of 660,000 gallons.



Tank and pressure vessel sections are welded together automatically on powered rolls in the Tank Shop.

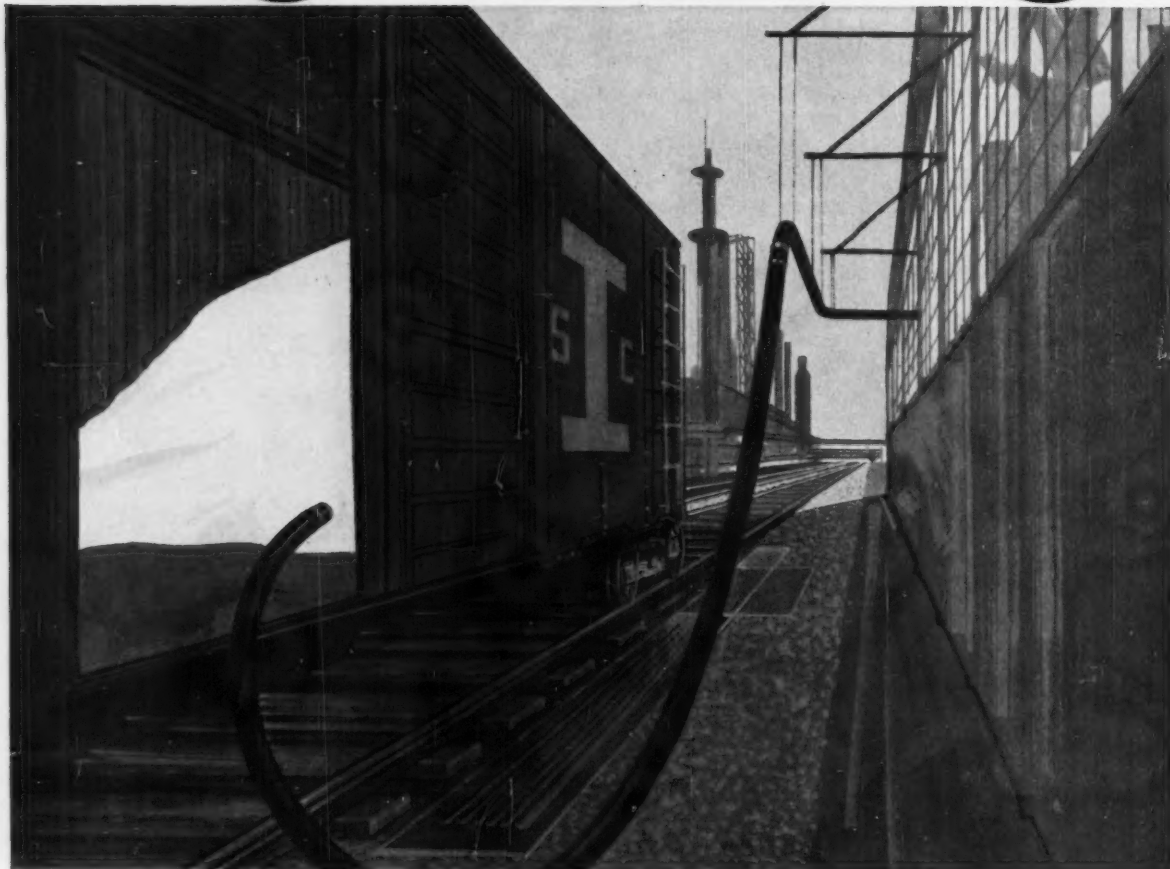
Facilities to build, and facilities and capacity to move and lift—Avondale has both. The 600-ton lifting device lowers a 242' tank.



AVONDALE SHIPYARDS, INC.

P. O. BOX 1030 • PHONE University 6-4561 • NEW ORLEANS 8, U.S.A.

salt engineering



UNIQUE SALT AIRLIFT

Quick way to move salt at lowest cost

Until recently, a chemical plant unloaded boxcars of bulk salt with two-ton wheeled carts, hauled the salt to elevators and lifted the cart to the second story where the storage bin was located. 20 to 25 trips were necessary to unload a car. It was a continual, 8-hour operation.

Upon the recommendation of an International Salt Company Technical Service Representative, the plant installed a pneumatic handling system. Salt is sucked out of the cars and conveyed directly up into the

storage bins... at a rate of 10 to 12 tons per hour. It's fast, automatic... eliminates spilled salt and manual labor.

International also recommended changing to a type of salt having handling and storage characteristics specially suitable for this usage.

A leading supplier of salt to the chemical, food-processing and meat-packing industries, International is

uniquely equipped to evaluate your salt operation. Even if you're satisfied with your present system, perhaps it *could* be improved. Why not review your operation with an International Salt representative? Salt is his business. He can make sure that you're taking advantage of the newest innovations in salt engineering. Write International Salt Company, Clarks Summit, Pa., or district office.

BOSTON CHARLOTTE CINCINNATI NEWARK NEW YORK PITTSBURGH
BUFFALO CHICAGO DETROIT NEW ORLEANS PHILADELPHIA ST. LOUIS

INTERNATIONAL  **SALT COMPANY**

"A STEP AHEAD IN SALT TECHNOLOGY"

PROCESS ION EXCHANGE NEWS

FROM
Nalco[®]
No. 1 of a series

CONVERSION

Preparation of Acids from Salts
Preparation of Vitamins
Decalcification of Milk Products

PURIFICATION

Sugars Polyols
Pharmaceuticals Biologicals
Separation and Purification
of Acids
Sweetening of Natural Hydrocarbons
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CATALYSIS

Epoxidation and
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Esterification
Protein Hydrolysis
Glycols Preparation
Condensation and
Addition Reactions

**NALCO Know-How
in Liquid Processing**

For Information Write . . .

PROCESS ION EXCHANGE for Purification-Separation-Concentration-Recovery

Ion exchange resins, long known for their effective water conditioning capabilities, are coming into ever-increasing use in chemical processes such as separation, purification, concentration, and recovery. As these case histories indicate, ion exchange procedures offer new and efficient

techniques to supplement—and often replace—older conventional procedures.

Nalco Chemical Company's long experience in ion exchange can provide you with effective help in investigating potential applications of this versatile processing tool.

PURIFICATION OF SOLVENT STREAMS

The removal of impurities from aqueous and non-aqueous solutions of many organic intermediates is not readily accomplished by distillation or crystallization—but, in many cases, Dowex ion exchange resins have easily and inexpensively removed these impurities. For example, in:

Organic Chemical Manufacturing—An aqueous solution of a polyol intermediate used in plastics manufacture is contaminated with 1 per cent sodium formate. A mixed-resin bed utilizing Dowex 50W (a strong acidic cation exchanger) and Dowex 1 (a strongly basic anion exchanger) now completely removes this contamination. The treatment cost: only a fraction of the increase in selling price made possible by up-grading product quality.

Commercial Formaldehyde Production—Formic acid and iron, production impurities in commercial formaldehyde, are regularly removed by two-bed demineralizers using Dowex 50W and Dowex 3, a weakly basic anionic exchanger. Such demineralization units are now integral to a number of formaldehyde production plants, and many processors use similar demineralizers to purify stored formaldehyde prior to use.

Textile Fibre Manufacturing—Using distillation to purify solvent spinning baths is uneconomical; purification by precipitation is impractical. However, objectionable trace quantities of organic and inorganic salts are quickly and economically removed by side-stream treatment of the solvent in a mixed-resin bed of Dowex 50W and Dowex 21K (strongly basic anion exchanger).

Plastics Intermediate Manufacturing—Hydrochloric acid, added to a non-aqueous solution of an alkali-unstable organic intermediate to minimize decomposition, is extremely corrosive in the final distillation step. This acid is completely removed by passing the solvent stream through a column of Dowex 3 resin prior to fractionation, and corrosion of the distillation unit is virtually eliminated—without product degradation.

Nalco Know-How + Dowex* Resins = Effective Ion Exchange

The case histories in this series illustrate the effectiveness of ion exchange in liquid processing. Nalco's background and experience with both conventional and new techniques may well be put to work for you, to solve

your process problems.

Dowex ion exchange resins, manufactured by the Dow Chemical Company, are applied by Nalco Chemical Company and leading manufacturers of industrial ion exchange equipment.

ION EXCHANGE DIVISION

NALCO CHEMICAL COMPANY

6185 West 66th Place

Chicago 38, Illinois

Subsidiaries in England, Italy, Mexico, Spain,

Venezuela and West Germany

In Canada: Alchem Limited, Burlington, Ontario

Nalco[®]

... Serving Industry through Practical Applied Science

*Dowex is a registered trademark of The Dow Chemical Company.

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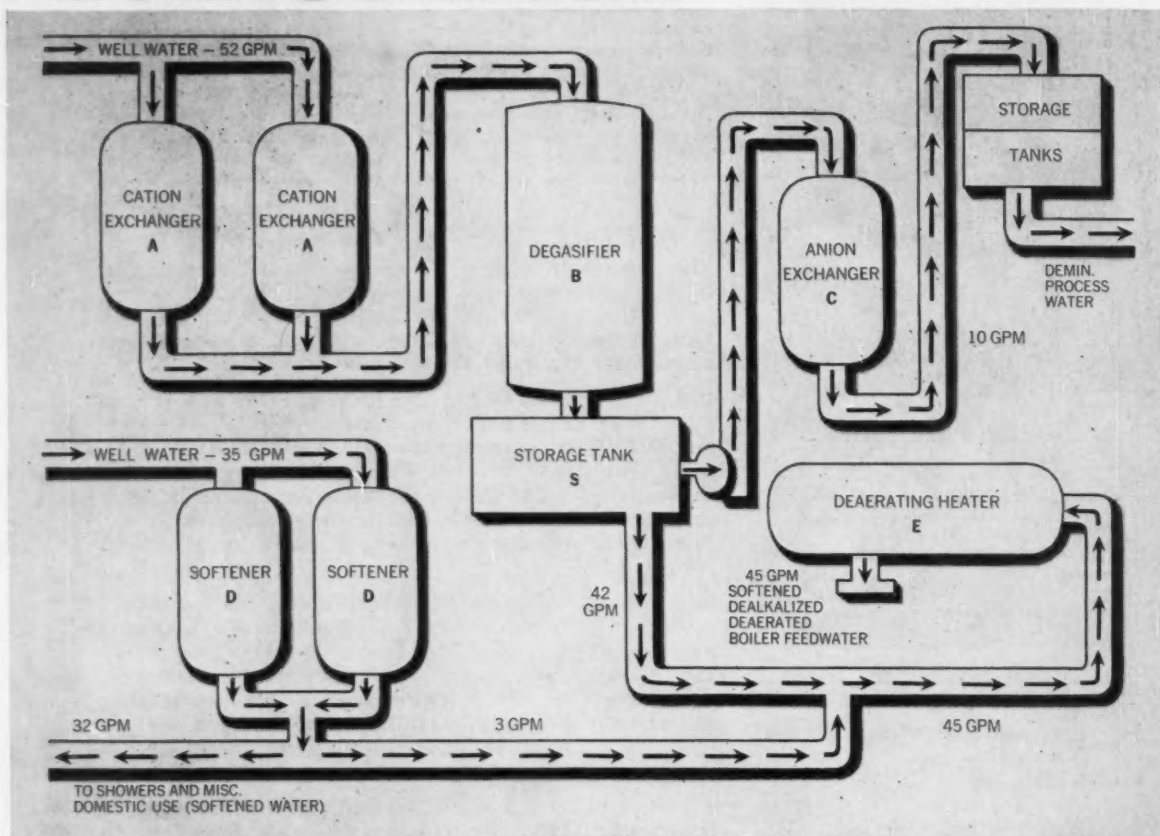
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FLUIDICS* AT WORK



How to get three kinds of water from a single treatment system

This is a diagram of the water treatment system at the new Owensboro, Kentucky plant of Dewey & Almy Chemical Division of W. R. Grace & Co.

Only one kind of water goes into this plant: raw well water, with a hardness of 11.6 grains per gallon.

But the conditioned water that comes out is suitable to meet the demands of three different applications:

It's demineralized, for use as process water in the making of polyvinyl acetate emulsions and butadiene-styrene copolymers.

It's also dealkalized and deaerated, for use as boiler feedwater.

And it's softened, for general miscellaneous use around the plant—washing, employee showers, etc.

How it's done. To do all these jobs the water receives a progressive treatment in a compact Permutit system.

First the raw water is divided into two streams. One, of 52 GPM flow, is processed through two Permutit Q hydrogen cation exchangers (A) and then through a Permutit

degasifier (B) into a storage tank. From this storage a 10 GPM stream is directed to an anion exchanger (C) where Permutit S-2 resin completes demineralization producing a finished process water.

Water for non-critical uses flows into the system at 35 GPM for treatment in two Permutit softeners (D) with Permutit Q resin.

Boiler feedwater requirement is 45 GPM so 42 GPM is supplied from storage (S) and three GPM from the softened supply. This

water is blended and fed to a Permutit deaerating heater (E) which delivers it ready for boiler make-up.

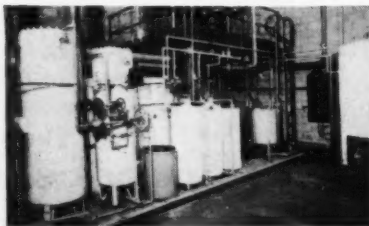
Guaranteed results. When this system was installed, there was no question about the quality of the water it would produce. Results were *guaranteed* by Permutit. Such guarantees are possible because of our unusual position in the water conditioning field. Not only did we originate the ion exchange system of water softening, but we are also the only company to manufacture *both* the equipment *and* the ion exchangers for all types of water conditioning.

Your water problem? Your water needs may be anywhere on the spectrum of water conditioning—from simple soft water, to highly critical requirements that call for Permutit "ultimate" water.

In any case, chances are good that we can solve the problem at minimum cost.

As a start, send for a free copy of Bulletin 4433, "An Outline of Modern Water Treatment Equipment."

Permutit Division, Dept. CE-51, 50 West 44th St., New York 36, N. Y.



Permutit water conditioning system occupies small space in corner at Dewey & Almy, yet processes every drop of water used throughout the plant.



PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS... the science of fluid processes

WORLD RECORD IN ETHYLENE!

Stone & Webster clients produce over
3.2 billion pounds of ethylene annually
in 37 plants in 12 countries.



This world record of ethylene engineering
experience is available to you.
Call or write our nearest office.



STONE & WEBSTER ENGINEERING CORPORATION

Affiliated with Stone & Webster Engineering Limited (London)

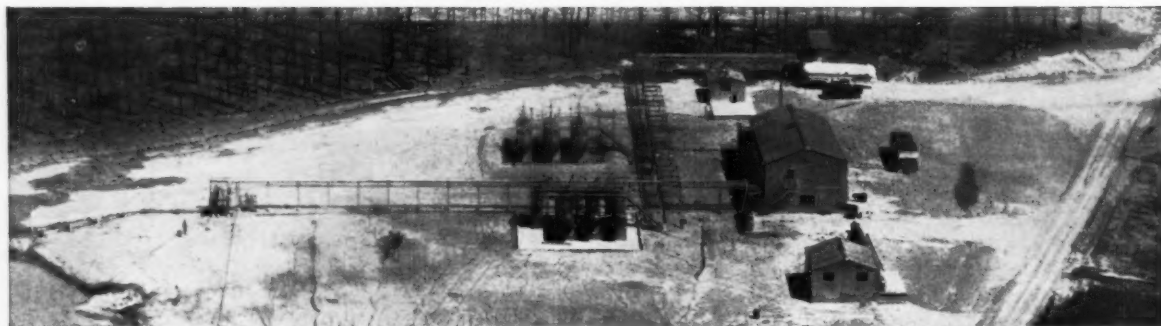
New York, 90 Broad Street

Boston, 49 Federal Street

Chicago Houston San Francisco Los Angeles Seattle Toronto Calgary

NOW! n-butyl lithium in tank-truck loads...

from Foote's new
capacity—first plant
designed and integrated to
produce lithium alkyls!



New capacity presently devoted to **n-butyl and secondary butyl lithium**—High-purity butyl lithium for polymerization and other organic reactions, is now available from Foote in commercial quantities. 100,000 pound-plus annual capacity tags Foote's new plant as the first and largest producer of *n*-butyl and *sec*-butyl lithium. High productive capacity plus readily accessible rail and truck services assure you prompt order handling and fast shipping.

To meet a variety of anticipated needs, the product may be ordered in a wide range of lot sizes. In bottles, cylinders, non-returnable drums, and tank trucks for commercial use. Standard solvent is hexane or any suitable hydrocarbon. Other solvents or concentrations are available as requested.

Foote butyl lithium is *pure*. It is also *safe* to handle and *stable* in storage. **SAFE**: solutions of 15% or below may now be shipped classified as flammable liquids and in non-returnable containers. **STABLE**: solutions can be stored at ordinary temperatures without change; they have been approved as stock items by a major chemical company.



FOR R&D, A SPECIAL OFFER Sample, 1-mole (64 gram) bottles of pure butyl lithium, taken from regular plant production, are now available at \$7.50 per bottle. Minimum invoice, \$15.00. Remember, bottles have been stored for at least eight months without deterioration. With each order, you get a complete fact file on butyl lithium . . . covers application, transportation, handling, hazards, safety. Here is an unusual—and inexpensive—opportunity to research many promising uses of this versatile chemical. Write Foote Mineral Company, 418 Eighteen West Cheltenham Ave., Philadelphia 44, Pa.



4

REASONS WHY IMCO CONTAINS THE BEST!!!!

Engineering Specialists. Design and product engineers at IMCO focus all their attention toward one end result... to develop your vision into a selling reality. Their know-how in the entire field of polyethylene container production enables them to produce almost anything your designers can conceive... quickly and economically.

Nationwide Service. IMCO's widespread manufacturing locations—from New York to California, from Canada to the Deep South, insure the fastest delivery possible. There is never any long, costly delay because your order must "stand in line" waiting to get into production. Big freight savings, too.

"Front-Runner" Stock Items. IMCO's task-force of R & D engineers prides itself on anticipating customer's needs. Containers as new as tomorrow are as close as your telephone... the IMCO-perfected double wall jar; tapered roll-ons, oblongs, ovals, cylinders, rounds; squares and gallon and half-gallon jugs are just a few of these stock containers.

Decorating Facilities to Solve Any Problem. Whatever method of decorating is most ideally suited to your particular problem, IMCO is equipped to handle it. Hot Stamping, Silk Screening, Offset or Therimage... IMCO decorates the best.

Surely this is the time to give your product the advantages of IMCO's knowledge and experience in the production of polyethylene containers. We can assist you in running tests of your products in IMCO containers, and we will be happy to quote prices on stock or custom-made bottles, jugs and jars. Call the sales office or plant nearest you or write direct to our Sales Manager in Kansas City. We'll have an IMCO Representative contact you within 24 hours.

IMCO

CONTAINER COMPANY

75th and Cleveland • Kansas City, Missouri
A Division of Rexall Drug & Chemical Company

Sales Offices

New York, N. Y.
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Park Ridge, Ill.
Los Angeles, Calif.
Cocksville, Ont., Can.
Montreal, Que., Can.

Mfg. Plants

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Cocksville, Ont., Can.
Kansas City, Mo.
Excelsior Springs, Mo.
Harrisonburg, Va.
Goleta, Calif.
Jeffersonville, Ind.

IMCO CONTAINS THE BEST

HARDWORKING JEFFERSON CHEMICALS



PROPYLE



Propylene Glycol adds a Venus touch

U.S.P. grade propylene glycol's beauty lies in its low toxicity and excellent solvent, hygroscopic and preservative properties. In cosmetics its solvent properties help obtain a more intimate dispersion of soaps, oils, waxes, greases, and other substances in water . . . help maintain the desired viscosity of an emulsion. Propylene glycol also adds to the rapid and complete dispersion of dyes and perfumes throughout a cream or lotion. Its hygroscopicity helps retain the texture and consistency of cosmetics during use . . . enhances the soothing emollient action upon the skin.

Because of its low toxicity, Propylene Glycol, U.S.P. is your most versatile polyol for use as

a color emulsion solvent in food flavoring and a humectant in packaged foods. It is also used in cork seals and cellulose coatings that contact food. In tobaccos, propylene glycol helps maintain proper moisture content over a wide range of humidities.

Industrial grade propylene glycol and dipropylene glycol are widely used as intermediates for polyester and alkyd resins, as a basic component for hydraulic fluids, as softeners and plasticizers, as solvents in steam-set printing inks and in solvent-extraction processes. Jefferson's technical service people can be most helpful in your special application problems.

PROPYLENE GLYCOL

Industrial and
U. S. P. Grades

PROPYLENE GLYCOL

SPECIFICATIONS

INDUSTRIAL GRADE:

Specific gravity, 20/20°C.....	1.0375 min. 1.0390 max.
Acidity as acetic, wt. %	0.005 max.
Water, wt. %	0.2 max.
Color, Pt-Co scale.....	10 max.
Ash, wt. %	0.005 max.
Boiling range, ASTM, °C.....	185-189

U.S.P. GRADE:

(Same as specifications for Industrial Grade with the following exceptions:)

Boiling range, ASTM, °C.....	186-189
Acidity as acetic, wt. %	0.003 max.
Chlorides as Cl, wt. %	0.0001 max.
Sulfate N.....	None
Arsenic as As ₂ O ₃ , ppm.....	1 max.

SELECT PROPERTIES

Boiling point, 760 mm.....	187.4°C.
Flash point (open cup)	225°F.
Melting point	<-60°C.
Molecular weight.....	79.09
Specific gravity, 20/20°C.....	1.0381
Viscosity, 20°C.....	60 centipoise
Weight, 20°C.....	8.62 lbs./gal.

Select Properties same as for Industrial Grade
Propylene Glycol

DIPROPYLENE GLYCOL

SPECIFICATIONS

Specific gravity, 20/20°C.....	1.020 min. 1.025 max.
Acidity as acetic, wt. %	0.01 max.
Water, wt. %	0.1 max.
Color, Pt-Co scale.....	15 max.
Boiling range, ASTM, °C.....	222-238

SELECT PROPERTIES

Boiling point, 760mm.....	231.8°C.
Flash point (open cup)	280°F.
Viscosity, 20°C.....	107 centipoise
Weight, 20°C.....	8.5 lbs./gal.
Molecular weight.....	134.17
Specific gravity, 20/20°C.....	1.0252
Melting point.....	<-60°C.

SHIPPING AND HANDLING

Propylene glycols are available from Jefferson in 4,000-, 6,000-, 8,000-, 10,000-gal. tank cars, tank wagons in most areas, and 55-gal. resin-lined drums.

The handling and storage of these glycols is in most cases a straightforward operation. They present no hazard of explosion, polymerization, fire, health, or other industrial risk. They are hygroscopic and have extremely low vapor pressures. There are, however, certain uses requiring extra protection against contamination during handling and storage . . . explained in detail in our technical literature.

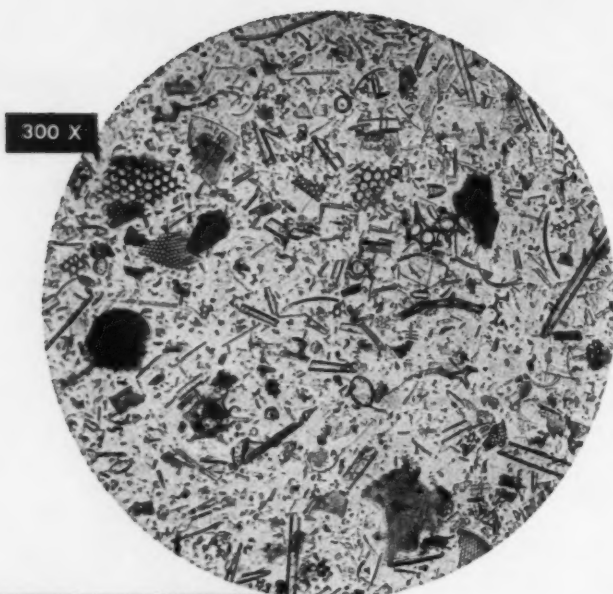
TECHNICAL INFORMATION

Request these new, up-to-date Technical Brochures on Industrial Grade and U.S.P. Grade Propylene Glycols for detailed chemical and physical data . . . Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

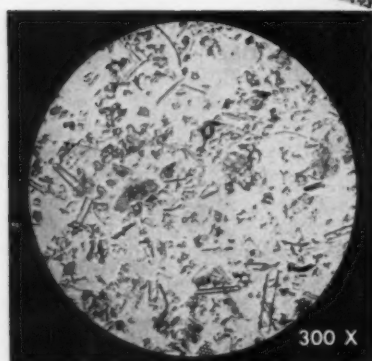
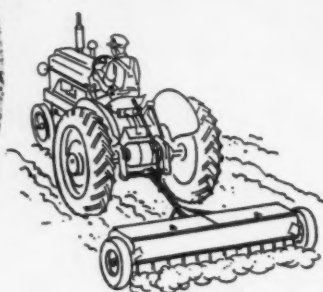


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CHARLOTTE • LOS ANGELES • SAN FRANCISCO

JEFFERSON CHEMICALS



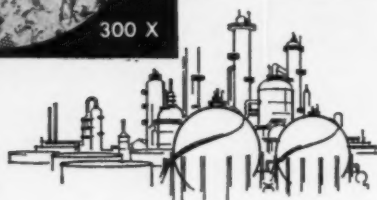
For fertilizer coating—Celite 379, a natural milled diatomite, provides the uniform conditioning needed to prevent caking of granular, mixed or prilled fertilizers—maintains good free-flow characteristics even after prolonged storage.



For catalyst carriers—Super Floss, finest particle size flux-calcined Celite grade, is used where a non-reactive porous silica support is needed. (Also available: special Celite supports in many preformed shapes for strength, high temperature stability, resistance to abrasion and attrition.)



As a point-flating agent—Celite 281, air-floated fines of flux-calcined diatomite, provides uniform and efficient flatting at low cost. Contributes to control of low angular sheen, durability, and faster drying.



In diatomites, Johns-Manville precision processing works for you

Celite diatomite absorbs its own weight of liquid . . . yet stays 'dry'

No matter which of the many available grades you choose, you can depend on a given volume of inert Celite* to retain its typical dry-powder characteristics even after absorbing its own weight of liquid.

Actually, Celite can absorb a total of more than twice its own weight. That's because a mass of the fine skeletal particles is approximately

93% air space or voids. Yet, in spite of this very high porosity, Celite is essentially non-hygroscopic.

Other unique properties—extremely high bulk, irregular particle shape and large available surface area—ideally suit Celite to hundreds of mineral filler applications. It is produced with precision from the world's purest commercially available dia-

tomite deposit. It offers a wide choice of grades, each carefully controlled for complete uniformity.

For technical data on specific mineral filler or filtration problems, talk to your nearby Celite engineer. Or write to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trademark for its diatomaceous siliceous products

JOHNS-MANVILLE



THE BEST WAY... THE SWEPCO WAY

THE PIPE YOU JUST ORDERED



LARGE DIAMETER STAINLESS STEEL PIPE — IMMEDIATE DELIVERY FROM SWEPCO DISTRIBUTORS

No more waiting — Your order is filled from warehouse stock.

SIZE RANGES:

2½" - 12" in Schedules 40 and 80 in 20' to 24' lengths
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Available in all types of stainless steel and special metals and alloys to 30" OD in walls to 2" thick. Swepeco distributors are ready to help you in selecting the exact and most economical grade of pipe for your particular application. Call or write for full information.

Swepeco

TUBE CORPORATION

One Clifton Boulevard • Clifton, New Jersey

Manufacturers of FFR
Full Finished Rock-
Forged Pipe and Tubing

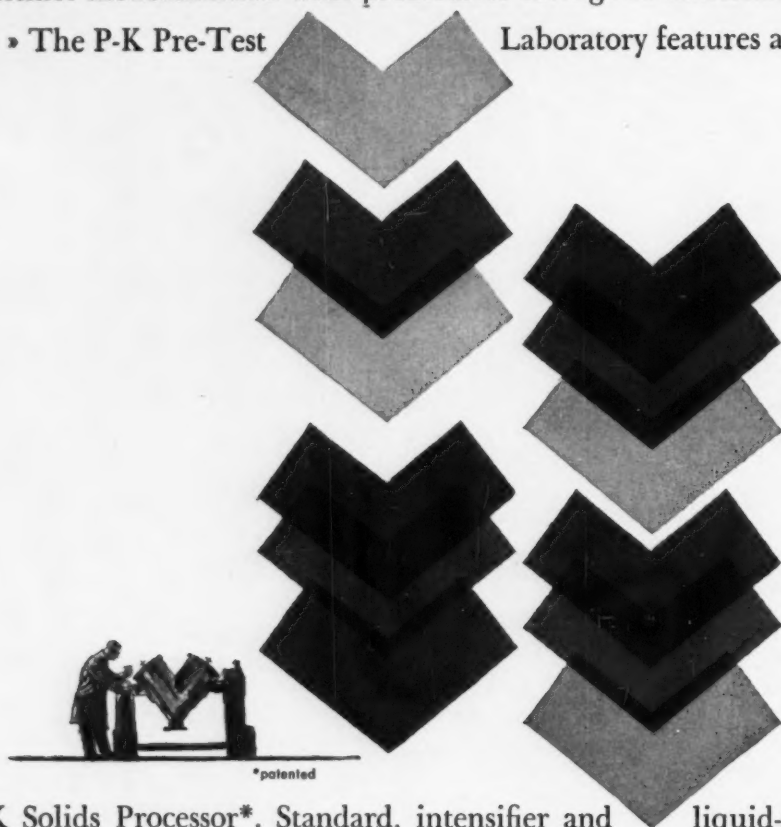


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P-K Pre-Test Laboratory **re-evaluates equipment** **in solids processing**

Solids processing operations are seen in new perspective at the unique P-K Pre-Test Laboratory. Revolutionary new solids processing equipment blends liquids and solids, granulates, vacuum dries, coats, reacts chemicals, sterilizes — telescopes as many as ten conventional multi-step operations into a single unit. Pre-testing provides accurate scale-up data and operational procedures. And it justifies modernization with predictable savings in materials, labor and equipment. » » » The P-K Pre-Test Laboratory features a pilot model of the



new P-K Solids Processor*. Standard, intensifier and liquid-solids Twin Shell* Blenders are also available, as are vacuum tumble dryers, double cone blenders and ribbon blenders. » » » Here too, P-K engineers who have run thousands of resultful pre-tests work out subtle variables in blending, granulating, drying — point out improvements in quality control and process modification impossible to see without pre-testing. » » » Why not explore the possibilities of improving your current processing methods? You can bring or send your materials. For particulars and a preliminary evaluation, write or phone George Sweitzer at Stroudsburg. Dial direct: 717-HA 1-7500.

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INDUSTRIAL CHEMICALS
ACTIVATED CARBONS
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Paint • Plastics • Petroleum • Marine
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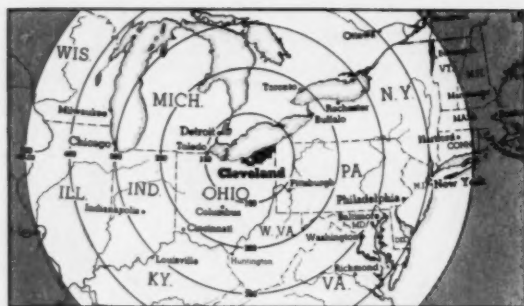
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Chairman of the Board, The White Motor Company

Robert Black tells
*why he feels the best
location in the nation
is better than ever*

"The Cleveland-Northeast Ohio area has always been the best location in the nation, and today it is better than ever. For one thing, many millions of dollars have been spent in the past few years improving roads and building new highways and freeways to supplement the nearby Ohio Turnpike. This complex of modern super-highways makes this an ideal distribution center for any company concerned with over-the-road hauls."



CORRIDOR OF COMMERCE. Cleveland-Northeast Ohio is within 500 miles of 75% of America's industries, 60% of the population, and no area has better transportation facilities.

5 MINUTES FROM THE HEART OF CLEVELAND. Burke Lakefront Airport is being used increasingly by private and commercial aircraft. It supplements busy Cleveland-Hopkins Airport.

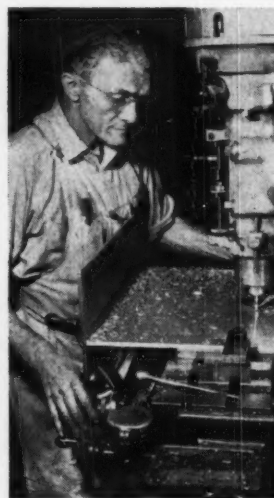
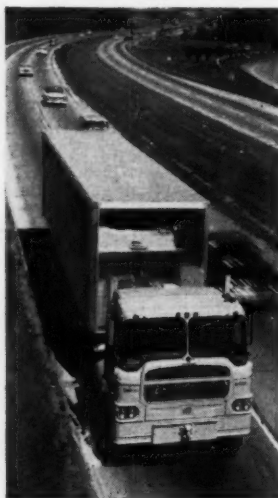


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TRONA boron chemicals are vital to the ultimate quality of the products you manufacture...and TRONA boron technology, through advanced research and development, is creating new and versatile forms of boron for your products of the future. Knowledge of boron chemicals and their production in volume are special capabilities of American Potash & Chemical Corporation...a basic and expanding source of boron for industry and agriculture.

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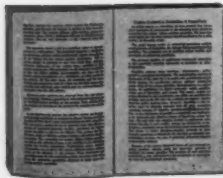
Make fumes and odors come clean . . . at a profit!

Heat values in exhausted plant fumes can be recovered for profitable use in plant processing or heating needs. As a result, operating costs are lowered and profits enlarged. And often of more importance, fumes and odors can be completely eliminated. Catalytic Combustion systems offer a completely effective means of converting noxious, combustible fumes and odors to re-usable heat energy and harmless, odorless and colorless exhaust effluent.

Catalytic Combustion, founded in 1950, has pioneered the development and application of catalytic oxidation systems for complete, often profitable, elimination of noxious plant emissions. Catalytic's method draws the fumes from processing equipment, heats the fumes when necessary, and passes them through a circulating fan to discharge through a catalyst bed consisting of all-metal catalyst elements. The catalytic principle takes advantage of the low catalytic ignition temperature, often as much as 800° F. lower than direct oxidation methods. Catalytic's systems provide complete oxidation of gases even though the temperatures of these gases are very low, and the concentration of combustibles is far below the flammable range.

Fuel savings with a Catalytic system compared to gas-fired direct oxidation can amount to as much as 80%. Compared to electricity still greater fuel savings can be realized. When heat is recovered from a Catalytic oxidation system, BTU dollars often pay for the catalyst bed in less than a year. After the initial cost has been recovered, the Catalytic system provides a fuel-saving heat source that lowers operating costs.

Air correction too, provides benefits. A Catalytic oxidation system enables plants to meet improved insurance standards . . . reduces fire hazards . . . provides cleaner, more healthful working conditions for employees . . . reduces plant and equipment breakdowns due to corrosion from condensate . . . and provides improved community good-will. Catalytic air correction removes odor and color from plant process fumes and exhausts clean, harmless air to the atmosphere.



Learn the facts about Heat Recovery and Air Correction . . .
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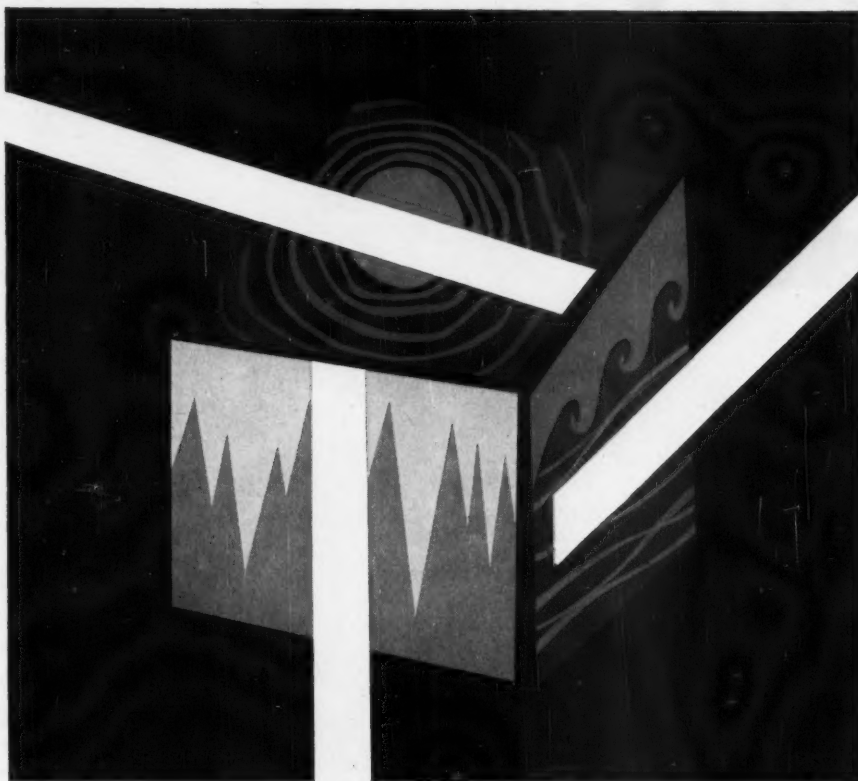


CATALYTIC COMBUSTION CORPORATION

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Sticks Here...Here...Here



In Heat, Cold and Moisture Silicone Adhesives Hold!

The exceptional durability of Dow Corning pressure sensitive silicone adhesives makes them dependable for tapes, sealants, spray-on coatings, bonding materials and splicing agents. Perhaps there's a special property you need in an adhesive . . . or a special *combination* of properties? Here, briefly, are the properties of Dow Corning silicone adhesives. Silicones may offer exactly what you need.

They stick anywhere! At temperatures ranging from -80 to 500 F, pressure sensitive silicone adhesives stay stuck and don't deteriorate. They withstand the effects of moisture, oxidation, corrosive chemicals, weathering, arcing, corona and fungus. For electrical applications, silicone adhesives provide excellent dielectric strength.

As tapes. Dow Corning silicone adhesives are used with most backing materials. Now readily available from several manufacturers are tapes with backings of glass

cloth, Teflon, Mylar, aluminum foil, silicone rubber and combinations of these materials. Typical applications include: high temperature electrical insulation; bonding, splicing, and sealing; masking in chemical milling; release surfacing, and electroplating.

Or alone. For a fastening adhesive in rugged service, silicones may be your answer. For example, silicone adhesives in combination with asbestos fibers are used to coat and insulate hot air ducts in aircraft. Other tough applications: sealing ends of heat elements in appliances, bonding mica and asbestos panelboard, and bonding silicone rubber to the coils of electrical equipment.

Dow Corning Silicones may well be your adhesive of the future. For more technical information or assistance, write Dept. 2818.

Available now — list of manufacturers supplying pressure sensitive tapes with silicone adhesives.



Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

June 24, 1961 CHEMICAL WEEK 29

ONE OF A SERIES OF CHATS ABOUT
CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

A FAMOUS FLUID WITH TEMPERATURE CONTROL PROBLEMS

Wine has never been properly appreciated by enough people. Many think you simply press grapes, bottle the juice, and wait a while to create wine. Even those who pride themselves on their knowledge of this age-old drink are seldom aware of the artful thermal engineering required. Pasteurizing wine is actually one of the most tricky and delicate feats in the field of liquid processing.

Take temperatures. Wine must be pasteurized at 140°F. Those are the facts of life in the world of wine. They might not seem too difficult to live with unless you're in the wine or chemical processing business.

Take New York's Monarch Wine Company, producers of Manischewitz Wine. Their Problem: how to maintain the 140° temperature in the heat exchangers despite wide variations in the rate of wine flow. These variations, between 5 to 60 gallons per minute, result from slowdowns and recoveries in the bottling process. Problem: entire system must be capable of complete shutdown when necessary. Problem: wine temperatures must be raised to 140° as rapidly as possible, sometimes an immediate jump of 100°

Attracted perhaps by aspects of the situation that had little to do with pure science, Sarco engineers applied the collective experience of Sarco technology to the solution of this serious problem. The result

for Monarch: the degree of control the process demanded—achieved through the excellent use of Sarco Temperature-Pressure Regulators, Float Thermostatic Steam Traps, Thermo-Dynamic Steam Traps, and Pipeline Strainers.

Sarco engineers, ever resourceful, divided each of the two large Cherry-Burrell plate-type heat exchanger units into two separate sections with a blank baffle plate, each with a separate Sarco control. Thermal sensing bulbs were installed in wine discharge and throttling controls hooked into steam supply. As demand fluctuates, one or both regulators function to maintain the 140° temperature.



In higher demand, both regulators are operative; as demand drops and flow decreases, only one regulator supplies steam. Pasteur himself would have been elated.

Each of six smaller capacity shell-and-tube heat exchangers required only one regulator, with the sensing bulb inserted into the outlet side of the wine filled shell, and the regulator throttling steam supply to the tube section. Thus, by controlling flow of steam to the exchangers on the basis of pressure and temperature, the Sarco regulators were able to maintain the temperature of the wine at precisely 140° regardless of fluctuations in demand or supply rate. Whew! A lot of engineering went into those two sentences.

From here on it's downhill. To secure complete cut off of the steam supply during scheduled shutdowns of the bottling run, solenoid valves were provided to supplement normal modulating action of the controls. To discharge widely varying loads of condensate continuously and remove immediately all air and incondensable gases, Sarco Float Thermostatic Steam Traps were installed on all condensate outlets. On the drips before each control valve a Sarco Thermo-Dynamic Steam Trap was installed to insure delivery of dry steam. Sarco Pipeline Strainers were installed before all steam traps and valves

to protect them against damage by any foreign bodies. And thus ends a classic story of the grape.

Still, this story has been condensed far too much, really, and we feel you've been cheated out of the story's more delicious details. You needn't be, however. We've printed the facts in detail for posterity and you in Sarco Case History 185, complete with drawings that practically make it a do-it-yourself kit. If you would like a copy, we will be flattered to receive your request, and dispatch it with dispatch.

WE'RE ALWAYS IN . . . AND THE WELCOME MAT'S OUT

We always take it for granted that if you are going to be in the vicinity of our plant you'll phone or drop us a line so we can invite you to visit us. You'll find that our factory in Bethlehem, Pennsylvania, is on many well-travelled routes and that our steam laboratory has much to offer in interest and helpfulness. Forgive us for being immodest, but the lab is the most up-to-date of its kind in the country.



When you visit us, don't allow yourself to get sidetracked by the drill presses and automatic lathes. We're proud of this equipment but you've probably seen metal mutilated before, and it's our steam laboratory that's unique. We promise you a good show, and if you have any problems, bring them along. We'll solve them while you wait.

ANYONE FOR KEY CHAINS?

We seem to have these key chains. Want one? They're much more convenient than a case. A tiny replica of a Sarco Thermo-Dynamic Steam Trap, Type TD-50 is attached, but you can always remove it if you find it too commercial. There must be many things you could use these chains for. Fishing sinkers? Lengthening a light cord, maybe? Anyway, if your Sarco representative is out, write in.

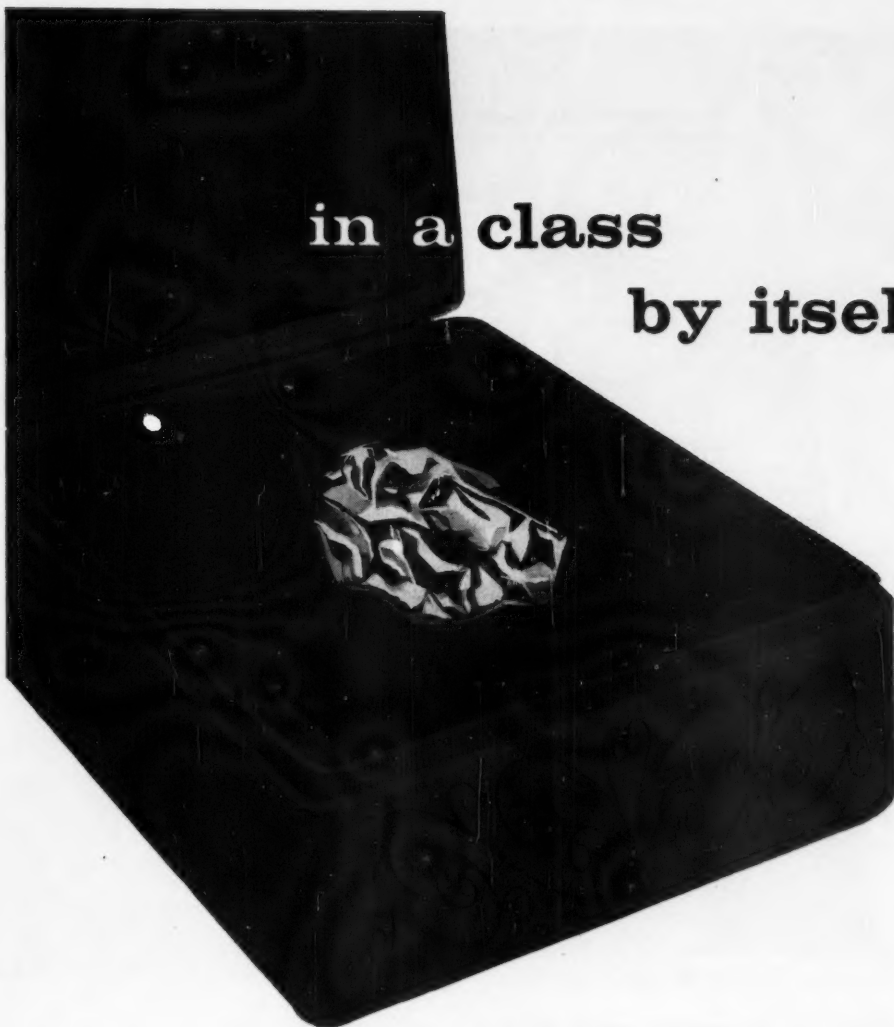
Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate.

6354

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Piccolyte

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Piccolyte's outstanding advantages are used in caulks, cements, chewing gum, leather treating, paint, paper coatings, adhesives, printing ink, rubber, textiles, and wax compounding.



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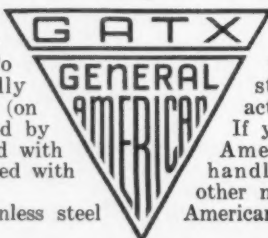


Applying first layer of 10" glass wool insulation.

GATX TANK CARS KEEP THE HEAT ON CAPROLACTAM

General American Develops a Tank Car to Transport a Problem Liquid that "Freezes" at +156°F

Caprolactam is a difficult liquid to transport, because it "freezes" and becomes a solid if allowed to "cool off" to +156°F. To protect caprolactam and deliver it rapidly and safely, special 10,000-gallon tank cars (on roller bearing trucks) have been engineered by General American. These cars are insulated with 10-inch blankets of glass wool, and equipped with 22 lines of inside-outside heating coils. Caprolactam is loaded at +176° into stainless steel



tank cars. Inert gas is then pumped in to prevent contact with the atmosphere. All these help deliver caprolactam in a liquid state. A 3-inch circulating line can provide action to facilitate unloading.

If you have a problem liquid to ship, General American has the car, or can build one, to handle it. For further information about the other new cars, call or write your nearby General American office today.

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GENERAL AMERICAN TRANSPORTATION CORPORATION

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Baker, pioneer of the electrothermic method, assures you CS₂ of highest purity and uniformity—at low cost.

SPECIFICATIONS FOR Baker CARBON DISULFIDE, TECHNICAL

Boiling Range _____ 0.5° C.
Specific Gravity at 15°/15° C. _____ 1.270-1.275
Residue after Evaporation _____ 0.001% Max.
Foreign Sulfides & Dissolved Sulfur _____ Passes Test**
Sulfite and Sulfate (as SO₂) _____ Passes Test**

*Boiling Point of Pure CS₂ at 760 mm. = 46.3° C.
**A.C.S. test for the absence of these impurities in reagent carbon disulfide.

STANDARD CONTAINERS

TANK CARS—8,000 gallon (83,000 lbs.),
10,000 gallon (105,000 lbs.)
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gallon, 5 gallon.

If you manufacture rayon or cellophane, rubber accelerators, carbon tetrachloride, flotation agents, insecticides—or any one of a wide variety of other products—you want Carbon Disulfide with *uniformity* and *purity* at *low cost*.


To assure all three of these essentials, Baker produces Carbon Disulfide by the unique electrothermic method, a process invented by Taylor, and improved and perfected by Baker.

This special method...coupled with continuous rather than batch distillation...insures uniformity in the finished product. You will find Baker Carbon Disulfide exceptionally free from other sulfur compounds.

No matter what product you manufacture—if it requires a superior Carbon Disulfide of controlled purity and uniformity at low cost—it will pay you to specify Baker.

Baker is one of the principal volume producers of Carbon Disulfide. Our production is continuous...our sales are made in Tank Car or Carload Lots to many of the large users. If you require Carbon Disulfide for your process, Baker solicits your business.

Address J. T. Baker Chemical Co., *Executive Offices*, Phillipsburg, N. J.

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REAGENT •  • FINE • INDUSTRIAL
Phillipsburg, New Jersey



Gas chromatography does complex solvent analyses in minutes. Here, a Shell chemist prepares a sample for injection.

BULLETIN:

Shell Chemical announces a monograph describing 31 tests—some standard, some ingeniously devised—to give you greater insight into surface coatings.

Shell uses these 31 tests as a backbone in lacquer formulation. They have led to startling concepts such as *the advantages of solvent retention* and to remarkable new high boiling solvents such as Pent-Oxone* keto-ether and Pent-Oxol* glycol ether.

Read how you can get an indexed, 60-page copy of this monograph telling how to set up these 31 tests, how to run them and how they can help improve your current formulations.

THE 31 tests used regularly at Shell Chemical's Technical Service Laboratory in Union, N. J. have led to some fascinating new fields of investigation. One is solvent retention.

A twist on solvent retention

While slow solvent release is known

to cause film shrinkage and have a bad effect on print resistance, *retained* solvent has recently been found to have good effects on gloss retention and restoration, cold crack resistance and weatherability.

Test 29 can help you study these dual effects in terms of *what actually happens when lacquer dries*.

Two remarkable new high boilers

Studies of this type led directly to Shell Chemical's two remarkable new high boilers: Pent-Oxone keto-ether, particularly promising in formulations with dissimilar resins and Pent-Oxol glycol ether for *maximum blush resistance/practical drying time* in nitrocellulose lacquer formulations.

How to get your monograph

To get your monograph, write or call any of the 9 district offices of Shell's Industrial Chemicals Division. Or

write Shell Chemical Co., 110 W. 51 Street, New York 20, N. Y.

Samples and information

When writing for a copy of the monograph, ask for samples and information on any of these items:

Acetone	Isopropyl Ether
Bisphenol-A	Mesityl Oxide
Diacetone Alcohol	Methyl Amyl Acetate
Di-tertiary-butyl peroxide	Methyl Ethyl Ketone
Ethyl Alcohol	Methyl Isobutyl Carbinol
Ethyl Amyl Ketone	Methyl Isobutyl Ketone
Glycerine	Neosol® Solvent
Hexylene Glycol	Pent-Oxone* Keto-ether
Isopropyl Alcohol	Pent-Oxol* Glycol Ether
	Secondary Butyl Alcohol

*Trademark, Shell Chemical Company

A Bulletin from
**Shell
Chemical
Company**



Industrial Chemicals Division

Business Newsletter

CHEMICAL WEEK

June 24, 1961

New moves and countermoves are breaking fast in the battle for stock control of Chemical Process, the West Coast manufacturer of ion-exchange resins, polyesters and adhesives (*CW Business Newsletters*, May 27: June 17).

The latest: over the weekend, Commercial Solvents lifted the 200,000-share limit on its offer to buy shares of CP common at \$15/share; no change was made in the June 23 deadline, however. Diamond Alkali, which had matched the earlier CSP limited bid, now says it will also buy all shares tendered.

In a letter to stockholders last week, CP's board of directors played up the Diamond offer; the board has approved a Diamond-Chemical Process stock exchange merger deal (in preference over one proposed by CSC), and the proposal comes up for a shareholders' vote Aug. 15.

In the latest maneuver, Commercial Solvents' President Maynard Wheeler points out that "the final decision on the approval or disapproval of the pending merger proposal (with Diamond) lies with the stockholders of Chemical Process." Wheeler adds, significantly, that "Commercial Solvents is the largest stockholder."

The implication, of course, is that if the CSC stock-purchasing drive is successful, the Diamond proposal will be voted down in August.

Other large CP stockholders (like the chemical and fertilizer company with 11,000 shares) are reportedly sitting tight, but watching, as the heated shuffling drives up the value of their CP holdings. At close of business Friday (June 16) Chemical Process was quoted over-the-counter as 15¼ bid, 16½ asked—higher in both columns than either the CSC or Diamond offers.

•
The U.S.'s archaic depreciation laws are under fire again. New blasts were leveled by *Steel* magazine's John Morgan at a management seminar held during the annual convention of the National Assn. of Metal Finishers in Boston over the weekend (June 16-19).

Morgan, echoing potent prodepreciation reform arguments (*see CW Depreciation Report*, March 25, p. 111), charged that present laws are forcing U.S. industry to underdepreciate at a rate of about \$6.5 billion annually. He also lambasted the investment credit proposal being pushed by the Kennedy Administration as an "aspirin remedy when a wonder drug is required."

•
Crackdown on export of American technical data to the Communists. Last week the U.S. Dept. of Commerce slapped a 90-day restriction on the overseas operations of Hydrocarbon Research Inc., which

Business Newsletter

(Continued)

is currently completing a contract to design and supervise construction and initial operation of an oil refining and petrochemical plant in Rumania.

Commerce Dept. policy is to deny Communist countries access to any unpublished scientific data originating in the U.S., and the agency says it wants to find out whether the New York firm used "forbidden" material in connection with its Rumanian contract. Says Commerce: "The nature of the investigation to date warrants close scrutiny of any and all of the Hydrocarbon group's prospective transactions with the Sino-Soviet bloc and Cuba."

Hydrocarbon Research denies violating U.S. export regulations, has agreed to imposition of the ban on supplying any American data or commodities to the Communist bloc and Cuba, without specific authorization from Commerce.

The 90-day order also binds the firm's affiliates, Hydrocarbon Engineering (Paris), and Hydrocarbon Mineral of Düsseldorf.

•
Annexation payout agreement was reached late last week between five CPI companies and Deer Park, Tex., city officials. Shell Oil, Shell Chemical, Diamond Alkali, Rohm & Haas and Lubrizol together will pay \$175,000 in taxes and \$200,000 in lieu of taxes annually for five years.

The plants—which were incorporated into the Deer Park city limits last December—will determine among themselves what portion of the total each will pay. Under a prior agreement, the city was not supposed to annex the industries, but had been collecting \$30,000 annually in taxes and \$130,000 in lieu of taxes.

Deer Park will "de-annex" parts of the plants so that only valuations to justify the \$175,000 tax bite will remain on the rolls.

•
The Supreme Court has turned down a request by Du Pont to stretch out the 10-year period that it gave Du Pont to rid itself of its General Motors stock (*CW Business Newsletter*, June 10, p. 18). The court issued its brief order on the last day of its 1960-61 session.

•
It's Westinghouse Electric that's building a 1-million-gal./day sea-water conversion plant at Point Loma, Calif. A previous report identified the project with another electric company.

Timetable calls for completion of the plant in Nov. '61, after which Westinghouse will run it for a 75-day shakedown period, including 30 days at the full daily output rate.

Architect-engineering services for the multistage flash-evaporator plant (to be the largest in the U.S.) were handled by The Fluor Corp. (Los Angeles). The Ralph M. Parsons Co. (also of Los Angeles) is participating in the engineering and construction of the installation.



in Spain

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Over 50 years of world-wide
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Put knowledge on the scale. Throw in zonal maps, freight rate charts, applications data—the conglomeration of information that marks your Mathieson representative as a chemicals expert. Get his shoes in, too. That's for plant visits, trips in the field, operations research (your plant, your field, your operation). Toss in pencils for the never-ending calculations. And telegrams. And confirmations. And paper flow charts.

The weight still is not accurate, of course. What symbols can you include for experience or determination? But, measurable or not, the result is the same. Mathieson service gets chemicals into your process efficiently and economically. For service with results, call —

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CHEMICALS DIVISION **Olin**







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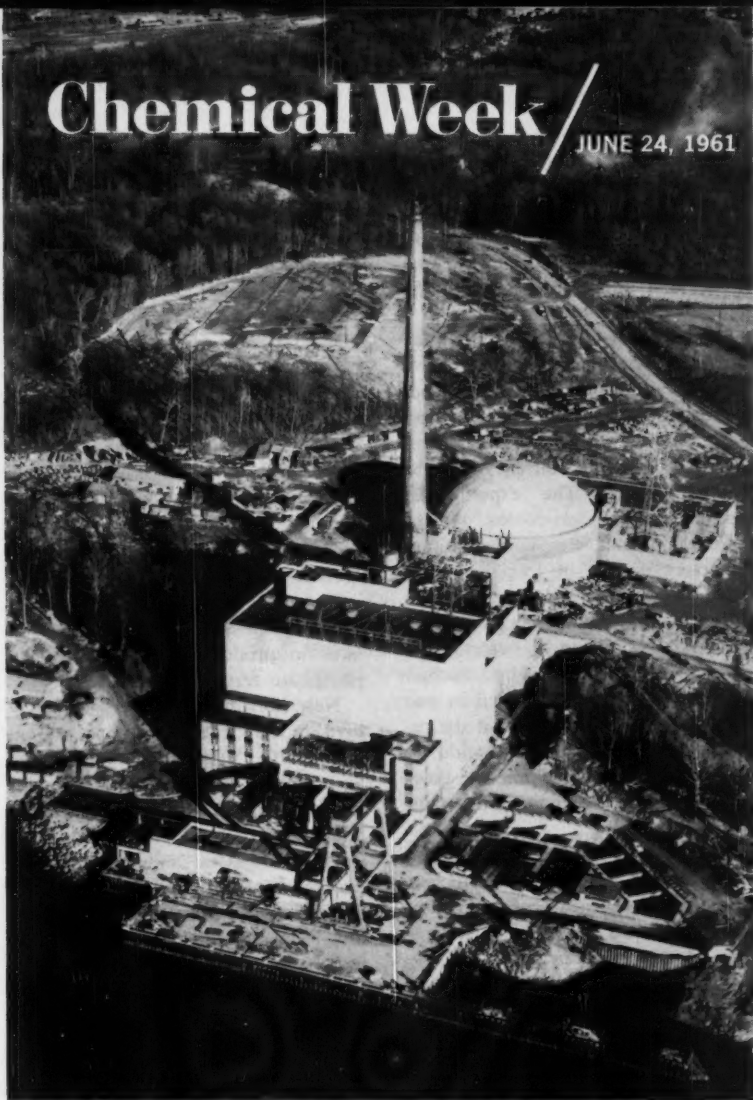


No doubt about it—under hard usage and severe conditions Chase bags pay off in better protection for your chemical product. Every Chase bag must pass the rigid tests of the Chase Standards Laboratories—to make sure that it is constructed of the *right* materials for the chemical it is designed to carry. Moreover, Chase's policy is to use only the finest materials available—paper, textile, polyethylene—carefully selected from the best of many market sources. Chase has demonstrated unusual skill in solving special chemical-packaging problems. A recent Chase development is the Poly-Ply Multiwall Bag. Ideal for the storage of hygroscopic chemicals, it combines the moisture-proof protection of polyethylene and the superstrength of heavy-duty multiwall paper. If you have a packaging problem, call the Chase Man.

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** A Chase Bag will make your product a Very Important Package*

MULTIWALLS • TEXTILE • PLASTIC AND LAMINATED BAGS • CONSUMER-SIZE PAPER BAGS
AND OTHER PACKAGING MATERIALS



At Indian Point, N.Y., 275-megawatt reactor nears completion.

Due: A-Power Pickup

Things are looking up for nuclear power this week. After a definite slowdown—few major contracts were signed in '60—the industry feels it's in a better position for an upswing thanks to three recent favorable developments:

(1) Reduction in nuclear fuel charges by the Atomic Energy Commission.

(2) Decision by the Supreme Court upholding AEC's policy for determining nuclear plant safety.

(3) Encouraging reports on the operation of the Yankee Atomic Electric Co. project at Rowe, Mass.

Although most companies expect no great rush of new contracts immediately, it does seem plain that the

climate is now more favorable for a pickup in growth rate.

And AEC Chairman Glenn T. Seaborg, in a policy statement, calls for attainment of economically competitive nuclear power by '68.

Most AEC commissioners predict a significant upswing in the nuclear industry, but one—Robert S. Wilson—says this will depend on whether certain sectors of the industry change views on doing business with AEC.

"When industry is ready to step in and take certain risks, there'll be plenty of atomic business," Wilson says. He adds that there is too much unfounded criticism by business when it doesn't get guaranteed profits under AEC contracts.

Nuclear process heat, thought to be a long way off, continues to get AEC attention. The commission has issued an invitation to chemical and paper mill firms to enter into a joint project—AEC would pay all the nuclear costs—for building and operating a demonstration process-heat reactor. No proposals have been received so far, but AEC is still hopeful.

Cut-Rate Uranium: Effective July 1, AEC is reducing prices for its enriched uranium by amounts ranging from 20% for material that is 90% enriched, to 34% for 1% enriched; at the same time the use charge is being raised from 4% to 4.75%/-year (*CW Washington Newsletter*, June 10).

A General Electric official has estimated that the net result will be a saving of about 0.3-0.4 mills/kwh., or about \$500,000/year for a 300-Mwe single-cycle reactor. This, he feels, may well be enough to put several potential customers in the mood to sign contracts.

The reduction has been based on the lowered price, AEC will pay for uranium oxide (from \$12 to \$8/lb.) It does not reflect the reported substantial economies achieved in the past few years in the gaseous-diffusion enrichment process. This leaves the door open to further price cuts. One counterbalancing factor: nuclear arms agreements might force decrease in enrichment capacity, boosting the unit production costs.

High Court's Clearance: One of the industry's worst fears has been that red tape in getting approval of plant sites and safety procedures would cause long delays in the development of commercial atomic energy (*CW*, Feb. 18, p. 33).

The outlook brightened last week when the Supreme Court ruled, seven to two, that AEC can allow a company to start building a power reactor with only a tentative showing of safety, deferring a final safety test until the plant is ready to operate. The court also ruled that AEC can allow reactors to be constructed as near large population centers as is "consistent with public safety."

This declaration removes the legal uncertainty from the status of the 100-Mwe Enrico Fermi fast-neutron breeder reactor at Lagoona Beach, Mich., within 35 miles of both Detroit

and Toledo on Lake Erie. Three labor unions with large memberships in the Detroit area had turned up an AEC advisory committee report that cast doubt on assurances that the Fermi plant would be perfectly safe. Last June, the U.S. Court of Appeals in Washington agreed with the unions that if final safety approvals were delayed until after the plant were completed and millions of dollars had been invested, AEC would feel tremendous pressure to permit operation.

The court also ruled an experimental reactor should not be located near sizable cities "without compelling reasons."

In its appeal, AEC argued that the lower court decision could seriously hinder private development of nuclear energy. With the final safety approval delayed until the plants are completed, the agency maintained, fool-proof safeguards can be developed during construction. Requiring final safety determination before construction would cause needless delays.

Justice William J. Brennan, reading the majority opinion, said AEC had found "reasonable assurance, for present purposes, that the reactor could be safely operated at the proposed location, and that is enough to satisfy the requirements of the law."

The dissenters, Justices William O. Douglas and Hugo L. Black, termed AEC's procedure "a light-hearted approach to the most awesome, the most deadly, the most dangerous process that man has ever conceived."

The industry, of course, agrees with the ruling; some executives expressed surprise it was not unanimous. They point out that with huge investments involved, industry can't risk the adverse public reaction that would result if plants proved unsafe. If anything, they feel, present safety practices are overcautious.

Results at Yankee: Another bright note for the industry has been the favorable results so far at the Yankee project, which began operation last November in Rowe, Mass. A company official reports the reactor is producing 125 Mwe gross, about 3-4% better than anticipated. Costs have run about 11-13 mills/kwh., compared with the New England average of 8-10 mills for conventional power. Yankee officials did not expect to get these results until the third or fourth core was installed,

which puts them about three years or more ahead of schedule in this respect. Also expenditures for the plant's installation and first year of operation reportedly will run at least \$10 million under the budgeted \$57 million.

Improvements Needed: Present-day reactors produce steam at temperatures and pressures that were standard for turbines many years ago, and specialists say higher temperatures are needed before efficiency can be boosted further. The experimental high-temperature gas-cooled reactor at Peach Bottom, Pa., with 20 times the power density of England's Calder Hall unit, may be the answer.

High fuel-fabrication costs add to the general problem of capital expense involved in getting into nuclear power. The extent is reflected in one industry man's contention that the recently cut enrichment costs could be eliminated entirely and nuclear power would still not be competitive with fossil fuels.

Fuel burnup is another stumbling block. Only a certain part of nuclear fuel can be burned before fission products created absorb enough neutrons to stop the reaction.

One consultant in the field has stated no real progress can be made until private companies take over. Current nuclear power prices, he says, are hard to evaluate since they include use and buy-back charges that are arbitrarily set by the AEC. He asserts that one reason utilities are entering what he calls a potentially unprofitable field is the desire to keep the government out. The utilities admit nuclear power will be expensive for some time, but maintain its long-term prospects are very good.

Long-range Optimism: Most experts in the field agree in general with this timetable for nuclear power:

By 1965-'70, competitive in areas with high-cost conventional power.

By '75, competitive in medium-cost areas.

By 1980-'85, competitive in low-cost areas.

Several factors can affect these figures. High construction costs in a given area can offset gains in production costs. The price of fossil fuels could decrease and make competition tougher (though many experts feel nuclear fuel costs have greater potential for savings).

TVA Tools Up

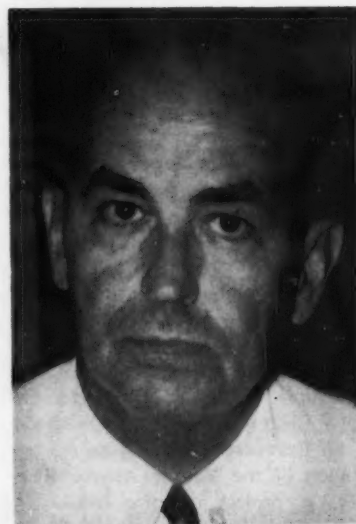
Two new construction and alteration projects are under way this week at Muscle Shoals, Ala., where the Tennessee Valley Authority's chemical division is developing new phosphate fertilizer products and processes.

Larger of these is construction of a \$3-million electric furnace for elemental phosphorus production. The 25,000-kw. unit—to replace several smaller and obsolete furnaces—is slated to begin operation early in '63. Its rotating hearth will make one revolution every 150-300 hours.

The other job involves alteration of a pilot plant for testing a pan granulator in production of high-nitrogen phosphate fertilizers.

New horizons for TVA's chemical division were traced last week by Gen. Herbert D. Vogel, chairman of the agency's board of directors. He said studies will include soil-phosphorus relationships, development of slowly soluble fertilizers, and possible production of fertilizer from coal. The latter was described by TVA as a long-range investigation into possible use of low-grade coal as the source of carbon in compounds that would contain certain essential plant food materials.

TVA also has been working on use of coal as a partial replacement for more expensive coke in phosphate smelting.



TVA's Vogel: Research figures strongly in his long-range chemical plans.

Acetylene-Vinyl Projects Under Way in the Southwest

Features	DIAMOND ALKALI at Deer Park, Tex.	MONOCHEM, INC., at Geismar, La.	TENNECO CHEMICAL near Houston, Tex.
ACETYLENE UNIT			
Capacity	40 million lbs./year	80 million lbs./year	100 million lbs./year
Process	Montecatini	Badische Anilin	Soc. Belge de L'Azote
Contractor	C. F. Braun	Chemical Construction	M. W. Kellogg
VINYL CHLORIDE UNIT			
Capacity	90* million lbs./year	150 million lbs./year	200 million lbs./year
Contractor	Scientific Design	United Engineers & Constr.	(to be designated later)
OTHER PRODUCTS AT SAME PLANT			
	Ammonia—100 tons/day	Oxygen (for own use)	Vinyl acetate, ammonia, and methanol—in "substantial quantities"
OTHER COMPANIES INVOLVED			
	Monsanto Chemical—to market the ammonia	Borden Chemical—to use acetylene and off-gas to produce vinyl acetate and methanol in adjacent plant; Borden and U.S. Rubber to share the vinyl output for their respective PVC plants.	Cary Chemicals—to buy much of vinyl output for production of PVC and PVAc resins
ONSTREAM DATE			
	Jan. 1962	May 1962	Fall 1962

* Estimated by CW.

Three-Way Race for New Vinyl Capacity

Three big Southwest projects that together will increase U.S. vinyl chloride capacity by nearly one-third are racing into the home stretch this week with the letting of more contracts for major units. All three are integrated operations starting with production of acetylene by partial oxidation of methane from natural gas.

Diamond Alkali, which awarded its main contracts last fall, appears to be safely in the lead; it says construction is on schedule, should be completed by Jan. '62. Monochem—jointly owned by Borden Co. and U.S. Rubber—held groundbreaking ceremonies last April, may be ready for startup in about a year.

Site Work Started: Running third, but with the biggest project, is Tenneco Chemical, subsidiary of Tennessee Gas Transmission Co., which last week let the first two big contracts for its plant. M. W. Kellogg Co. (New York) will put up the acetylene unit, based on a process developed by Societe Belge de L'Azote (Liege). Bechtel Corp. (San Francisco) is already doing off-site work.

In addition, Tenneco contracted with Hydrocarbon Research (New York) for oxygen needed in the acetylene unit. HR will construct an air-separation plant on the Tenneco site for this purpose. It will also supply nitrogen for Tenneco's ammonia unit and "other uses" not yet specified.

Tenneco says it will award contracts later for construction of four other principal units of its big petrochemical complex. The company puts the capacity of the vinyl chloride monomer unit at 200 million lbs./year, says the other units will turn out "substantial quantities" of vinyl acetate monomer, ammonia and methanol.

Financing a Customer: Much of the production of both vinyl monomers will be shipped to Cary Chemicals (East Brunswick, N.J.), for production of polymer and copolymer resins in Cary plants at Flemington, N.J., "and possibly two other sites," according to Cary, which is planning a \$13.5-million expansion program (*CW*, Feb. 11, p. 23). Projected aggregate capacity of Cary's three resins plants: 150 million lbs./year. Tenneco has

invested \$4 million in Cary, agreed to invest up to \$3 million more.

Salt Base: Arrangements for the Monochem project reveal a new growth spurt by Morton Chemical, subsidiary of Morton Salt Co. (Chicago). Morton Chemical—headed by 49-year-old Joseph E. Rich, formerly vice-president of Simoniz Co.—will build at Geismar a plant to supply anhydrous hydrogen chloride needed for Monochem's vinyl chloride unit.

Feedstock for its anhydrous hydrogen chloride unit will be muriatic (hydrochloric) acid produced by Morton Chemical at Weeks Island, La., and barged to Geismar via the Intra-coastal Waterway and the Mississippi River. Last November, Morton Chemical was granted a \$3.5-million Louisiana state tax exemption for expanded plant facilities to make muriatic acid and sodium sulfate (salt cake).

Together with the related facilities, the three big acetylene-vinyl projects will cost well over \$100 million, turn out 450 million lbs./year of vinyl chloride, possibly 100 million lbs./year of vinyl acetate.



Polymer's Rowzee: Tougher for rubber.

Which Way for Polymer Corp?

This week, a special committee of the Canadian Cabinet is weighing the feasibility of selling the government-owned Polymer Corp. Ltd. to private interests. The war baby that has grown to the point where it produces 10% of the non-Communist world's synthetic rubber is now at a crucial point in its history. About 60-70% of its output goes to export markets; a just-beginning surge in foreign synthetic rubber production could dry up these export markets within a few years.

Polymer President E. Ralph Bowzee intends to fight back by getting in on the overseas plant building boom himself. He has mapped out a \$30-million expansion program in Europe. This is more than the company can finance out of retained earnings (usually \$6-7 million a year), so it must go either to the government or the money market.

The Cabinet committee decided this was an appropriate time to consider again whether Polymer was outgrowing government ownership and should be sold into private hands. Recogniz-

ing the competitive situation, however, it meanwhile gave approval to the expansions.

Aside from not wanting to lose a good moneymaker—the investment was long ago paid off and the company has returned to the government \$3-\$4 million/year in addition to taxes—the government could get into political trouble trying to dispose of Polymer. The most logical purchasers are subsidiaries of foreign companies and Canadian officials have had to assure Parliament that control of the company will remain in the country.

Most eligible suitors:

Ventures Ltd., a mining investment group, has made the only firm offer, was rejected last year on a bid of \$75 million. Its chairman, J. D. Barrington, is a former president of Polymer.

Dow Chemical of Canada has its plant next door to Polymer, in Sarnia, Ont., uses similar raw materials, overlaps in products (styrene, latexes).

Goodyear, Goodrich, Firestone and Dominion Rubber are the four companies that ran Polymer's copolymer unit during the war.

Imperial Oil, subsidiary of Jersey Standard, is Polymer's major supplier, operated the major part of the Polymer plant during the war. It could offer strong financial support, a worldwide marketing and research organization.

Shawinigan Chemical has studied the possibility of purchasing Polymer, but has not made an actual offer. Shawinigan has solid Canadian financial strength, is involved in U.S. and foreign markets.

Worldly Wise: Noted for advanced production techniques and shrewd overseas marketing, Polymer Corp. has made the best of a difficult situation. The Canadian market could consume only about half of the company's 40,000-long tons/year production—it actually takes only 30-40%. Knowing that its Canadian customers (largely subsidiaries of U.S. tire companies that have excess SBR capacity of their own at home) might retaliate if Polymer entered the U.S. market in any substantial way, the company has kept exports to the U.S. to 5-10% of its production, hasn't sold aggressively here.

In contrast, the company's selling in other foreign markets has been very aggressive. It was first on the spot in

the European market, has set up an extensive distributor organization run by local nationals. The sales group emphasizes technical service in all languages (including Russian and Chinese; about 8,000 tons were sold last year in Russia and China) and dependability of deliveries. The company considers this last point so important that foreign orders get priority in shipments.

Western world synthetic rubber capacity is expected to increase more than 30% by '63, from 2.04 million tons to at least 2.7 million tons/year. Most of this will be in Polymer's major markets outside of North America. So far, the combination of new foreign producers and export competition from U.S. producers has served mainly to undermine price, and Polymer has been able to meet the competition.

The Sarnia operation is regarded as one of the most highly integrated and most efficient producers in the world, and the company boasts that it can match any of the nonintegrated U.S. producers in both production per unit of investment and output per unit of manpower, despite higher fuel and raw-material costs.

But Polymer knows that the export markets for North American synthetic rubber are bound to dwindle; and it wants to move fast to establish its own overseas plants. It is now building a \$12-million specialty rubbers (high-styrene and nitrile types) plant in France. A \$15-20-million butyl rubber plant, scheduled for Britain, may now go elsewhere, possibly Canada. Clarification of the geographic scope of Jersey Standard patents will decide where.

Other expansion projects now under way include construction of a 20,000-tons/year polybutadiene plant and a black-masterbatch line, both at Sarnia.

Polymer officials plan to push growth, regardless of whether they remain under government control or not. They point out that the government hasn't interfered to any appreciable degree so far, and for all practical purposes, Polymer operates like a private company. One area in which the company is moving ahead: use of lignin-SBR masterbatch (from domestic materials) to substitute for imported carbon black-natural rubber in truck tires.

Beefing Up Diet Food

American Viscose Corp. (Philadelphia) has decided to build a plant to start producing Avicel, its edible cellulose product, on a commercial scale by the end of this year. The company's stock price shot up 20% in the past month following publicity in national magazines about Avicel.

Up to now, the company has been producing Avicel at Marcus Hook, Pa., in a semicommercial plant with a capacity of 1 million lbs./year. The new plant, of course, will be much larger, but the company insists that it hasn't decided on either the size or location. The company says that a report appearing in several publications that the new plant would have a rating of 18 million lbs./year is "definitely wrong."

Avicel—a colorless, odorless and tasteless microcrystalline cellulose that adds bulk but no calories to food products—is being offered for various "carrier" applications in the food, drug and cosmetic industries, (*CW*, Oct. 8, '60, p. 104). Low-calorie recipes based on use of the product are being written under Avisco's auspices.

Expanding in Amines

Union Carbide is expanding facilities at Texas City, Tex., for production of ethylene diamine, diethylene triamine, triethylene tetramine and tetraethylene pentamine. To spur the growth of outlets, Carbide is reducing the price of ethylene diamine by 2¢/lb. (to 38¢/lb. in tank-car quantities). Carbide says the price of the other amines will remain the same for now.

Pennsalt is spending \$2 million on a near-doubling of the capacity of its alkyl amines plant at Wyandotte, Mich. Completion is due early next year. Ethyl amines, isopropyl amines and butyl amines will be produced.

Both expansions are considered routine by the companies involved. They are boosting capacity to keep pace with their steadily, if not spectacularly, growing end-uses—agricultural chemicals, sequestrants, surfactants, polyamide resins, pesticides, rubber accelerators, emulsifiers for waxes, and crease-resistant resins for textiles.

Pennsalt says its new unit will be the largest alkyl amine production

unit in the world. It will boost total U.S. capacity enough to take care of demand for the next several years. Carbide recently started up an alkyl amine plant at South Charleston, W. Va. (*CW Market Newsletter*, Feb. 25).

Most of Pennsalt's amine production is sold to specialties makers. But the company uses some captively to produce thiurams, dithiocarbamates and alkyl and alkanol amines. This is its fifth expansion in amines in the past 10 years.

Plastics-Brass Merger

Stockholders of both companies last week overwhelmingly approved the merger of National Distillers and Chemical Corp. and Bridgeport Brass Co. The tie-up, planned since last winter, will be carried out June 30.

This move will create a multi-industry company with sales volume of more than \$700 million/year and with 37 plants in 17 states turning out chemicals, plastics, fertilizers, nonferrous metals and fabricated metal products, as well as liquors. In addition, NDC holds a 60% interest in Reactive Metals, Inc., which produces and fabricates special metals—e.g., titanium and zirconium. For the past two years, Bridgeport has managed RMI on a contract basis.

After the merger, Bridgeport will become NDC's third main operating division. The others are the Chemical Division, including U.S. Industrial Chemicals Co., and the Liquor Division.

Various operating economies based on consolidation of sales, warehousing and other functions could amount to a saving of several million dollars a year, according to NDC and Bridgeport executives. There are many applications in which NDC's polyethylene and Bridgeport's metals are interchangeable or complementary, they say; and "another area of interest is polyethylene-coated metals."

To effect the approximately \$70-million acquisition, NDC will issue 2,049,972 shares of common stock and 202,510 shares of par-\$50 preferred stock. It will then have 12,368,370 common shares outstanding.

Bridgeport is the fourth-largest U.S. producer of brass, copper and bronze mill products.

Branching into Films

Allied Chemical—traditionally a producer of materials for industry—is taking another step toward the consumer. Its General Chemical Division will go into commercial production of plastic films, thus paralleling National Aniline Division's move into production of nylon fibers.

Last week President Frank J. French of General Chemical Division arranged to buy from Landis Tool Co. (Waynesboro, Pa.) a plant site with two buildings on a 27-acre tract two miles west of Pottsville, Pa.; and next month workmen will begin a conversion project to enable this plant to produce plastic films.

Initially, output will consist of Acclar fluorohalocarbon and Capran polyamide films, made from fluorocarbon and nylon-6 resins produced by the General Chemical and National Aniline divisions, respectively. But production of other plastic films is under study, he adds.

The new plant—with total available floor space of 27,000 sq.ft.—is scheduled to begin operating before the end of this year.

Previously, Allied carried out another vertical integration move in plastics by acquiring Specialty Resins Co. (Lynwood, Calif.), whose business of producing resins and plasticizers is now a function of Allied's Plastics Division (*CW Business Newsletter*, May 14, '60). And allied indicates interest in more integration.



Allied's French: Buying and converting a plant for new film venture.

INI Moving Ahead

The Spanish government's ambitious petrochemical plans came into clearer focus last week.

The controversial project is to go up at Puertollano, where the state's Calvo Sotelo company is building a 1.1-million-tons/year refinery. Puertollano is the terminus of the 2.5-million-tons/year pipeline from Malaga, which the government recently authorized (*CW*, June 17, p. 28).

The petrochemical complex would have a total output of 275,000 tons/year. Officials make a broad production breakdown this way: 84,000 tons of ethylene oxide, ethylene glycol, propylene, polypropylene, polyethylene, ethanol, and alkylphenol; 153,000 tons of ammonium sulfate, urea, and hydrochloric acid; and 38,000 tons of ethylene and other products.

INI, the Spanish government's industrial trust, is still trying to get financial participation and know-how from a foreign company. It is reportedly carrying on top-level negotiations with an unidentified foreign company. According to INI, an agreement may be wrapped up within a month.

Both Standard Oil (New Jersey) and Royal Dutch/Shell have been trying to get government permission to build petrochemical plants in Spain. Dow and its Spanish partner, Uniquinosa, won approval for their petrochemical plans last August.

OK for Nippon Fiber

Polypropylene fiber production plans of five Japanese companies were approved last week by the government's Ministry of International Trade and Industry.

Toyo Rayon and Mitsubishi Rayon will each produce 10 tons/day; Toyo Spinning and Shin Nippon Chisso Hiryo will produce 3 tons/day; and Asahi Chemical will make 1 ton/day.

This concludes a three-year dispute between Asahi and the four other companies. The latter have asserted that Asahi gains an unfair advantage by using technology it claims to be its own, while they are paying royalties to foreign licensing companies.

The four firms can now start production, even though it may be years before patent suits involving licensors are concluded.



Alcoa's Chairman Frank Magee aims to capture Australia's market.

Two More for Alcoa

In the last few years U.S. aluminum companies have been building up their world position by investing in overseas manufacturing plants, as well as in the more traditional development of foreign raw material sources. This week Aluminum Co. of America is getting two more foreign projects under way: a \$100-million integrated complex in Australia, and a \$16.5-million smelter in Mexico.

In Australia, Alcoa and a group of local mining companies have formed Alcoa of Australia Pty. Ltd. to build and run the complex. Alcoa will hold 51% interest; the rest will be held by Western Mining Corp., North Broken Hill Ltd., and Broken Hill South Ltd.

The new company's operations will span the Australian continent. Bauxite mining facilities and an alumina plant will be developed on the West coast, near Perth. The alumina will be shipped 1,700 miles to the port of Geelong, 40 miles from Melbourne, where a 40,000-long tons/year smelter will be built, as well as a plant to fabricate alloy sheet, foil, extruded shapes, tubular and other mill products.

The company will also build its own power plant at Geelong; it will utilize nearby coal reserves. The bauxite refining plant will produce alumina for export, as well as for the Geelong smelter.

The fabricating plant is to start production in Jan. '64. The smelter

will be built in two stages—20,000 tons to start up 18 months after construction starts in December; capacity will be doubled about 1966.

Two a Crowd? Last November, Kaiser Aluminum & Chemical Corp. revealed it was launching a huge joint venture with Consolidated Zinc Corp. on a 50-50 basis. This includes developing CZ's bauxite reserves and building a 360,000-long tons/year alumina refinery in Australia, expanding an existing smelter on Tasmania to at least 28,000 long tons/year, and building a power plant and a new, 120,000-long tons/year aluminum reduction works in New Zealand.

The two projects will have a total capacity of about 188,000 tons/year. Since Australia's consumption last year was only about 40,000 tons, and New Zealand is a much smaller market, much of the output will have to be exported.

Of the two companies, Kaiser seems more oriented toward exporting. It considers its facilities "ideally situated to serve world markets, particularly those rapidly developing in the Pacific area," believes consumption will more than double by '70.

Alcoa also plans to do some exporting, but believes the bulk of its output will be absorbed by a rapidly expanding Australian market. Per capita consumption is now only 8 lbs./year, compared with 24 lbs., in the U.S.

Since Australia lacks the rich iron resources of the U.S., and is enjoying brisk industrial and construction expansion, Alcoa believes there's plenty of room for aluminum growth.

And it believes it is in a better position to reach the Australian market than Kaiser, because its plant will be close to the most populated area in Australia, while Kaiser will have to reach it by ship from New Zealand, about 1,000 miles away.

Moving in Mexico: Alcoa's Mexican project is getting under way after about a year's delay. The venture was formed in '59. Alcoa will hold a 35% interest in the reduction plant—to be built at Vera Cruz—while 51% will be held by the Mexico City financial house, Intercontinental S.A., and other Mexican investors, and 14% by the American & Foreign Power Co. Negotiations had been snagged over power-plant and dock arrangements and financing.

national roundup

Rounding out the week's domestic news.

Companies

Atlantic Research Corp. (Alexandria, Va.) has acquired Sloane Mfg. Co. (Sun Valley, Calif.), producer of injection-molded plastic couplings, connectors, valves and other components. Stockholders of ARC—which is active in research, development and production of solid propellants for rockets—last week approved a plan to exchange two shares of newly authorized \$1-par common stock for each share now outstanding; this will raise the number of shares issued and outstanding to 1,612,914.

Haloid Xerox Inc. (Rochester, N.Y.) is changing its name to Xerox Corp. A new division, Haloid Photo Division, has been established to handle production and sales of the company's line of photo products. Xerox common stock and convertible debentures will be listed on the New York Stock Exchange; trading is expected to begin July 11.

Chas. Pfizer & Co. (New York) plans to acquire Paul-Lewis Laboratories (Milwaukee, Wis.) which develops and produces enzymes for the dairy, brewing, pharmaceutical and paper industries. Pfizer will issue about 60,000 shares of its common stock (market value last week: \$2.45 million) in exchange for all Paul-Lewis stock. The Milwaukee concern will become a Pfizer subsidiary; Paul Halmbacher will continue as its president.

Antilles Chemical Co. (authorized capital stock: \$5 million) and **Standard T Chemical Co.** (authorized capital stock: \$2 million) have filed charters of incorporation in Delaware. Corporation Trust Co. (Wilmington) is listed as principal office for both new companies.

Expansion

Sodium Silicates: Chemical Products Corp. (Cartersville, Ga.) is constructing a plant adjacent to its barium chemicals facility for production of a line of sodium silicates. Completion of the new unit—said to be the first basic sodium silicate operation in the Southeast—is expected in October.

Sodium Sulfate: Sifto Salt Ltd., a subsidiary of Dominion Tar & Chemical Co. (Montreal), has started diamond drilling on its sodium sulfate reservation at Weldon, N.B. The company envisions a plant that would supply eastern Canada paper companies' salt

cake requirements and also export the product into the eastern U.S.

Fat-Based Chemicals: Northo Chemical Co. (Cleveland), a newly organized concern, is completing its plant at Painesville, O., for production of hydrogenated oils, fatty acids, fatty alcohols, fatty acid esters and other chemicals derived from fats and oils. Raw materials will include hydrogen purchased from Diamond Alkali's adjacent plant, tallow, soya bean oil, castor oil, sperm whale oil, and various industrial and edible fats. Founders of Northo: John D. Hetchler, formerly sales manager of Archer-Daniels-Midland's Chemical Division, and Walter Somers, who had been plant manager of the former Hardesty Chemical Co. before it became the Harchem Division of Wallace & Tiernan.

LPG: Shell Oil Co. and six other petroleum companies are planning a joint venture to extract liquid hydrocarbons from natural gas at Yscloskey, La. Construction is scheduled to begin Aug. 1, and be completed by next May. The plant is designed to process up to 650 million cu.ft./day of natural gas, extracting 10,000 bbls. of propane, butanes and natural gasoline

foreign roundup

Rounding out the week's international news.

Soda Ash/Korea: Korea's Toyo Chemical Industries has agreed to purchase Japanese know-how and equipment for plants to make soda ash, caustic soda, calcium chloride and sodium bicarbonate in South Korea. With a loan from the U.S. Development Loan Fund, the company will pay Ube Soda (a leading producer of soda ash in Japan) \$700,000 for a technical licensing agreement; it also expects to spend about \$4.9 million for the Japanese-designed and -equipped plant. Soda ash capacity: 120 tons/day; onstream date: '64.

Fertilizers/Sicily: Fertilia Co. (Rome) and a Sicilian financial house have formed a new company, Biofert Sicilia, to build complex organic fertilizer plants at Palermo, Catania and Messina. Output: 100,000 metric tons/year by mid-'63.

Nylon/Spain: AKU (Arnhem, The Netherlands) has bought a stock interest in nylon fiber producer Perlofil S.A. (Madrid), will help it get into polyamide production.

PVC Resins/Japan: Nippon Geon Co. (Tokyo)—42% owned by B. F. Goodrich Co. (Akron)—is building a plant at Kambara to produce Goodrich's Geon chlorinated polyvinyl chloride resins. Initial capacity (Oct. '61): 50 tons/month; prospect: 1,000 tons.

Polypropylene Pair-Ups: Hedging Against an Uncertain Market

Producer	Capacity*	Location	Marketer	Arrangement
Enjay (Humble Oil & Refining produces the resin)	40 (can be expanded to 100); onstream	Baytown, Tex.	Spencer	Resin custom-produced to Spencer specifications, sold as Poly-Pro resin.
Shell	80; due mid-'62	Woodbury, N.J.	Union Carbide	Resin custom-produced to Carbide specifications, sold as Bakelite brand resin.
Novamont (Montecatini)	25; due late '61	Neal, W. Va.	W. R. Grace	Grace resells and services line of Moplen resin but does no blending.
Hercules	20; onstream	Parlin, N.J.	Du Pont	Starting late July, Du Pont will handle and modify resins for market development; name not yet chosen.
Dow	25-30; expected onstream at any time	Torrance, Calif.	Monsanto	Marketing agreement is over six months old but it goes into effect only when Dow's plant comes onstream, most likely within one or two months.
AviSun**	20; onstream	Port Reading, N.J.	Rexall†	AviSun thought to be current, prime supplier. Rexall's Elrex resin will be available early next month.

*Million pounds.
 **Also markets its injection molding and extrusion grades through A. Schulman Inc., rubber and plastics dealer.
 †Not confirmed by either participant.

Polypropylene Hopefuls Take Wary Course

Next month Du Pont and Rexall Chemical join the growing ranks of "polypropylene suppliers" that are marketing another firm's production instead of turning out their own. This cautious plan for gaining admission to the polypropylene business does more than reflect the hesitancy of companies hurt by polyethylene overcapacity—it suggests a new pattern emerging in plastics market development.

The producer-reseller approach to polypropylene will get still further emphasis before summer's end when Monsanto starts to sell part of the output of Dow Chemical's Torrance, Calif., plant. Dow's commercial capacity will be approximately 25-30 million lbs. It will market that part of the output not sold through Monsanto.

Du Pont, Rexall and Monsanto thus join Spencer, Union Carbide and W. R. Grace as prospective producers who have deferred their commitments on process and plant in favor of spe-

cial marketing tieups (*CW Market Newsletter*, June 17).

This marked trend to reselling mirrors deep uncertainty about polypropylene's future, bears out the bitter lessons learned as high-density polyethylene capacity was overbuilt and prices and profits were flattened.

Nothing New: Resale agreements are, of course, standard marketing tactics in the chemical process industries—and now even among polyethylene makers. But in the case of polypropylene, the caution is as much on the part of the committed producers (that want to minimize marketing risks) as on the part of those that don't yet see good enough reasons to build their own plants.

Enter Enjay: Among the first polypropylene pair-ups was the deal worked out last year between Enjay Chemical Co. (Humble Oil & Refining's chemical marketing arm, which had only limited plastics marketing

experience) and Spencer Chemical Co. (Kansas City, Mo.), which wanted a role in the market, yet balked at the fuzzy patent situation.

The Dow-Monsanto deal followed not long after Enjay-Spencer. This won't actually swing into an active relationship, however, until the Torrance plant starts up.

Then, early this year, Shell and Union Carbide revealed a swap arrangement in which Carbide will get custom-produced polypropylene from Shell's huge 80-million-lbs./year plant, while Shell will sell Carbide-produced high-density polyethylene.

Then, in quick succession during the past six weeks, marketing agreements were disclosed between producer Novamont (Montecatini) and W. R. Grace; producer Hercules Powder and Du Pont; and an unspecified producer (most likely, AviSun, although neither firm will verify it) and Rexall Chemical.

Why Pair Up? Although each of the resin producers and marketers had specific reasons for joining with another firm (and selecting a particular partner), certain industry-wide factors seem to foster this approach. For one thing, certain markets for the new resins have apparently not grown as rapidly as first predicted. The fiber and filament markets have possibly been viewed over-optimistically, say some observers.

Opinion, however, differs greatly on this. Some feel that the limited polypropylene supply is a more plausible reason for any shallowness in current market penetration. Another obvious factor promoting a "go-slow" approach has been the lack of clear distinction between outlets for polypropylene and high-density polyethylene.

Likely Benefits: Marketers stand to gain from the new agreements in several ways:

- They can quickly offer a more complete line of plastics—thus stay abreast of market needs and conditions.
- They avoid the huge capital investment in a plant, when process patents are still uncertain.
- They aren't forced to sell at low profit simply to keep a high-cost plant going.

Of course, resin producers figure their gains from these pairings are substantial, too—experience in polyolefin marketing; relatively high-level sales (with two sales forces in the field) and an earlier-than-originally-hoped-for period of reasonable profitability. Then, too, they stand to profit from more rapid market development and from processing experience.

Drawbacks: Although the advantages of these cooperative arrangements are convincing, there are certain drawbacks, as well. They are probably less apparent and certainly less important. To most industry observers, resin makers come off much better in this comparison. Aside from the expected problems of sometimes-difficult communications between two large corporate organizations (which may bother both makers and resellers), some observers expect resin makers' biggest problem to be competition with their marketing partners.

While some producer-company spokesmen tend to minimize the importance of this question, others meet it head-on.

"Certainly we'll be competing with our marketing partners," points out one sales manager, "but you can be sure we've got no agreements on which markets or accounts we'll dominate. We plan to sell as hard as we can, across the board, all the time."

But the problem comes back from time to time, as seen in the comment of one product manager who told **CHEMICAL WEEK** that "naturally, we have to put first things first and use some common sense in competing with our biggest customer."

Marketers' Difficulties: One possible problem that few resellers expect to be serious is lack of technical know-how and process management once they venture into captive production. Most of the agreements allow resellers access to process information pertaining to their custom production.

Observers are quick to point out, however, that almost any marketer is likely to encounter some difficulty—variation in resin properties—when he first transfers from purchased custom-produced materials to his own plant's output. This may pose something of a sales problem, but few resellers lose sleep over it.

Another problem situation that's forced on resellers, is the somewhat low profit margin in resale operations. This is generally dismissed as a small price to pay considering all of the obvious benefits of the schemes.

Taint on Reselling? Opinions vary

greatly on the importance, to the plastics processor, of dealing with the resin maker rather than a marketer or reseller. Some (particularly resin producers) tend to think that buyers feel better dealing directly with the resin maker. This is borne out by some polyethylene sales staffers who have sold under similar resale agreements.

But others contend that few processors will balk at dealing with industry giants just because they are in a resale, rather than, basic position.

All told, a clear majority of industry observers believe the raft of marketing deals will be beneficial to the industry and to the parties involved. Still, there are those who fear a price break, mainly because there are now more than a dozen marketers actively pursuing new business.

Resale Prospects: Among the prime polypropylene producers, only two—Eastman and Firestone—are not yet publicly committed to some form of marketing deal. What's more, both disclaim any intention of tying up with any other firm.

Among other companies known to be interested in a share of the polypropylene business, USI and Celanese stand out as good bets to enter the market as resellers, eventually.

But how might they accomplish that if all the prime producers are either committed or on the record as opposing any link-ups? Most likely by hooking up with a producer that is already supplying another reseller.

Rexall's Marketing Vice-President Carl Setterstrom, for example, states that his company has set up "resale agreements for polypropylene similar

Rexall's Setterstrom: Reselling resin from several sources?



to Rexall's resale arrangements on polyethylene," apparently implying that his firm plans to purchase polypropylene from more than one source. (Rexall buys polyethylenes from three makers.)

In fact, it's no secret that several major producers are selling resin to more than one company, and few in the industry would be surprised by any multicompany resale hook-ups.

There's little doubt that nearly everyone in the polypropylene race—actively or not—is watching this tendency to pairing closely, seeking clues to future moves. Some observers believe that most of the industry's nervousness will disappear provided markets for either fiber or oriented film open up as anticipated.

But only time will tell if the industry's hedge was sufficient to help solve the riddles and uncertainties of launching a new polyolefin.

DIMENSION

How Many Types?

One of the many unanswered questions about polypropylene's future concerns the number of product varieties—tailored resins—that are likely to find permanent uses. Early signs point to many—even more than in the polyethylenes. Reasons: growing demands for more specific resin properties, and polypropylene's varied response to post-synthesis treatments—considered by some observers to be more diverse than for any other commercial polymer.

These post-synthesis treatment methods—which are under the most careful scrutiny by nearly all resin marketers—range from chlorination and irradiation to compounding and physical blending with a variety of additives, colorants and other resins. Often, the product is re-extruded to yield a more uniform product.

Using these methods, any marketer or reseller can alter many of his resin's properties to explore commercial possibilities. He can do this without going to the resin maker for a special batch of polymer. Example: Du Pont is reportedly buying Hercules' resin in flake form, presumably to test its own stabilization systems or to try other post-treatments.

Bigger Role for Jumbo

"Super jumbo" railroad tank cars—with 30,000-gal. capacities—are bidding for a new role in chemical distribution. Until recently, cars of this size were so uncommon (less than 30 in service in the U.S.) they weren't considered seriously for chemical transportation. But in recent weeks all three major U.S. rail tank-car builders have made striking progress toward making more of these big cars available for regular chemical product shipments.

The big incentive: new, low rates on low-density chemical products (ammonia, LPG, ethers) scaled to compete with pipeline movements.

Underscoring the brighter prospects for large jumbo cars:

- General American Transportation Corp. (Chicago) has just unveiled a striking new design for a 30,000-gal. car using a bulge in the middle to boost cargo-carrying capacity. GATX says it already has orders for 85 of the big cars.

- Shippers' Car Line Division of ACF Industries, Inc. (New York), last week disclosed that it, too, will enter the giant jumbo car sweepstakes with a 30,000-gal. bulge-in-the-middle car, much like GATX's. It will be available by fall.

- Union Tank Car Co. (Chicago) disclosed last week that it has just received the largest single order for its "hot dog"-type, 30,000-gal. car. Tuloma Gas Products Co., which leased the first of Union's large jumbos a year ago, will lease 50 more of the cars for LPG shipments.

Beating Pipeline Rates: Key to the sudden surge in demand for supersize jumbo cars is the rate structure—which promises savings to some CPI shippers that can take advantage of the giant cars. In the big cars, railroad men may realize something they have long awaited: winning traffic from the pipelines.

Although the jumbo-car rates (table, right) are not lower than comparable pipeline hauls *per se*, they are lower if the end-of-the-pipeline handling costs (tank storage and truck or rail shipment to user) are included. For this reason, railroad

men expect to lure a sizable quantity of petroleum products from pipelines.

Chemical Hauls: Liquefied petroleum gases and anhydrous ammonia are considered the two best bets for substantial volume hauls in the new cars. Other possibilities include alcohols, ethylene, ethylene oxide, ethers and other solvents.

But the new cars will find virtually no application for many of the high-volume industrial chemicals—e.g., acids, fertilizer solutions and other inorganics and heavy organics—now moving over the rails. Reason: the larger cars (if fully loaded with dense products) weigh enough to cause great track and wheel damage. GATX's new car, for example, handles up to 140,000 lbs. of cargo, which works out to less than 4.7 lbs./gal. if a full 30,000-gal. load is carried.

In fact, the new cars will not be able to carry a full load of anhydrous ammonia, since its density is above 5 lbs./gal. Thus, ammonia cargoes in the jumbos may have to be approximately 25,000 gal.

Customer Problems: The new cars are considered to have more potential for intracompany shipments—from production point to storage terminals, or from oil well to refinery—than for customer deliveries. That's because few customers are equipped to handle 30,000 gal. of product at one time. Furthermore, the new cars could play havoc with freight equalization practices.

Bulge in the Middle: The GATX car is 66 ft. long (about 19 ft. shorter than the Union model); its tank measures 99 in. in diameter at each end, with the center swelling to 118 in. The company sells each car for \$24,000, but actually leases more than it sells to shippers (rates will be about \$300-\$315/month).

Other New Cars: The new orders for 30s swell the total number of jumbo cars (18,000 gal. or larger)

New Jumbo Tank-Car Rates*

	500 miles	1,250 miles
Standard jumbo car (20,000 gal.)	1.786	3.760
New king-size jumbo (30,000 gal.)	1.551	3.055

* In cents/gal. for LPG in Western Trunk Line Territory. Source: Tariff 2000G.

to nearly 2,000 in the U.S. Most are 18-22,000-gal. models, but since car builders intend to construct several hundred of the new jumbos annually, the 30s could become an important factor within a few years.

And the car builders don't plan to stop there. GATX is already considering possibilities of 37,000-45,000-gal. cars using its new design. Since heavier trucks would be needed (which would hike the cost), the car builders are looking for weight-saving methods to side-step this problem. Union, however, feels that 30,000 gal. is the maximum capacity that could be handled by a car of its "hot dog" design.

Right now, it looks as if the new jumbo cars may offer some savings to shippers of LPG, anhydrous ammonia and other light commodities, although they may never carry large quantities of industrial chemicals.

Dixie River Tieup

Traffic on the Tennessee River ground to a virtual halt early this month at all ports from Decatur, Ala., upstream to Knoxville, Tenn. Cause of the delay: a break in a lock at Wheeler Dam near Decatur, which could knock out normal river traffic for at least eight months, according to TVA spokesmen.

For chemical processors this will mean rerouting of some 98,000 tons of chemicals and 550,000 tons of petroleum products that annually pass through the Wheeler Locks—40-70% of total Tennessee River movements. And it may cause a delay in the country's space program: a Saturn booster was scheduled to be shipped in mid-July from Marshall Space Flight Center (Huntsville, Ala.) via Decatur and the Tennessee along the Mississippi and Gulf of Mexico to Cape Canaveral, Fla.

Besides rail and truck movements, other rerouting suggestions have been proposed: a pipeline around the dam for gasoline and other liquid products—this has been successful elsewhere—and conveyor belts over the lock for dry products.

A committee of shippers was meeting last week with TVA engineers to study the proposals. No long-term plans will be made, however, until a closer estimate of the lock's downtime is made. It is due next week.

How Chemical Rail Traffic Fared Last Year

Commodity	Total Freight Traffic (thousand tons)		
	'57	'59	'60
Chemicals, N.O.S.*	21,798	21,990	21,155
Sodium (soda) products	20,581	21,179	20,495
Salt	11,577	11,157	11,288
Rubber (crude, natural and synthetic)	4,058	4,706	4,627
Gases (other than petroleum)*	5,788	6,559	7,003
Sulfur	6,512	6,397	5,728
Acids*	3,078	3,356	3,410
Sulfuric acid	4,987	4,761	4,439
Alcohol*	2,689	3,003	3,023
Rosin and turpentine	1,290	1,386	1,204
Insecticides*	481	441	441
Tanning materials*	180	124	101
ALL CHEMICALS	83,019	85,059	82,914
Cellulose articles*	177	184	182
Plastics	1,950	2,562	3,115
ALL PLASTICS MATERIALS	2,127	2,746	3,297
DRUGS AND MEDICINES	550	605	620

* Not otherwise specified. Source: Interstate Commerce Commission.

CPI Rail Traffic Slips Again

Chemical process industries rail freight traffic continued its downward trend again last year, according to new figures compiled by the Interstate Commerce Commission. But against the backdrop of stagnating freight tonnages, plastics and drug shipments showed important new increases.

Rail shipments of plastics—spurred by big increases in bulk movements in hopper cars—now total 50% more tonnage than in '57.

Other product groups that moved over the rails in greater quantities last year included salt, compressed gases, acids other than sulfuric (which declined).

On the other side of the ledger, the biggest relative losses in rail volume were suffered by tanning materials (down 45% since '57). The traditional industrial barometer—sulfuric acid—reflected the economic lull,

dropped 10% below '57 shipments. Several other broad groups of chemical products also moved in smaller quantities.

Dashed Hopes: Although the new figures are not surprising, they indicate the scope of the railroads' problem. For as recently as last year (*CW*, Jan. 23, p. 79), Eastern railroad men voiced confidence in the railroads' ability to lure back some of their lost volume with new, more competitive rates. At that time Edgar Hill, chairman of the Traffic Executive Assn.—Eastern Railroads, noted that he believed the railroads had already lost nearly all the business they were going to. He predicted an average annual traffic gain of 3-5% for the railroads.

The new ICC figures clearly point out that the railroads have a serious battle on their hands to maintain their current chemical freight business.

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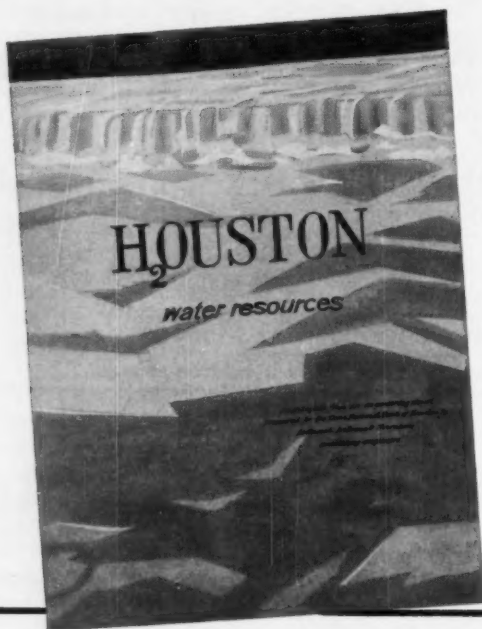
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SALES

CPI Ad Winners

Chemical process companies won considerable acclaim last week for their advertising prowess. They took six of the 10 BestSeller awards given by the Assn. of Industrial Advertisers.

The winners—Alcoa (which won the top prize), Du Pont, Monsanto, Pittsburgh Corning and Reynolds Metals (which won two awards)—were named at AIA's 39th Annual Conference in Boston.

Alcoa topped top honors for its promotion of Alumalure Finish—colored aluminum roofing and siding—to architects and builders.

Du Pont's award was based on its promotion of polyethylene film in bag packaging, while Monsanto's winning theme was "New Uses for Paper," designed to aid the sale of Mersize paper sizings. Pittsburgh Corning won its prize for a campaign to boost sales of sculptured glass blocks to the building construction industry.

Reynolds won one of its two awards for a campaign aimed at arousing automotive designers' interest in aluminum; the other for a campaign geared to industrial markets for aluminum.

More Cold Storage

Next month Texas Butadiene & Chemical International, Ltd., will break ground for a refrigerated butadiene terminal near Rotterdam, Holland. Its purpose: to provide backup supplies for European butadiene users, give TB&CI a foothold in the European market.

The new storage terminal—TB&CI's first in Europe—will consist of two insulated, 2,000-gal.-capacity tanks. It is expected to be in operation by Jan. '62.

The company, a subsidiary of Texas Butadiene & Chemical Corp., will provide the backup supplies via two refrigerated tankers—the *Methane Pioneer* and the recently converted *Iridina*. TB&CC already operates an 8,000-tons-capacity refrigerated storage terminal at Houston's Hess Terminal.

The new project is the second refrigerated storage and distribution terminal reported under way in recent week (CW, May 27, p. 105).



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ACL 60	Cl ₂ Na(NCO) ₃ 61	1	2	3
ACL 59	Cl ₂ K(NCO) ₃ 59.6	2	1	4

*based on cost per pound of available chlorine

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All four ACL compounds are ready for you now in quantity. If you make any bleach or sanitizing product—or are considering one of the many product opportunities in this field—you'll want to investigate what the ACL line can do. For a quick start, check the advantages described in the applications shown here. Then write on your company letterhead for working samples and technical help.



For household- and commercial-laundry dry bleaches, ACL compounds outperform older dry-type agents in efficiency, are safe for cotton and modern synthetic fabrics, do not cause pinholing. With ACL, you can market a dry bleach fully equivalent to sodium hypochlorite solutions in bleaching and sanitizing performance; and it's easier to store and ship, virtually mistake-proof to use.



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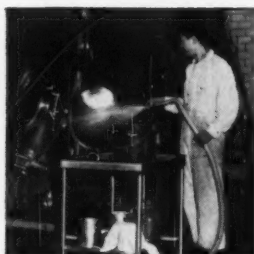
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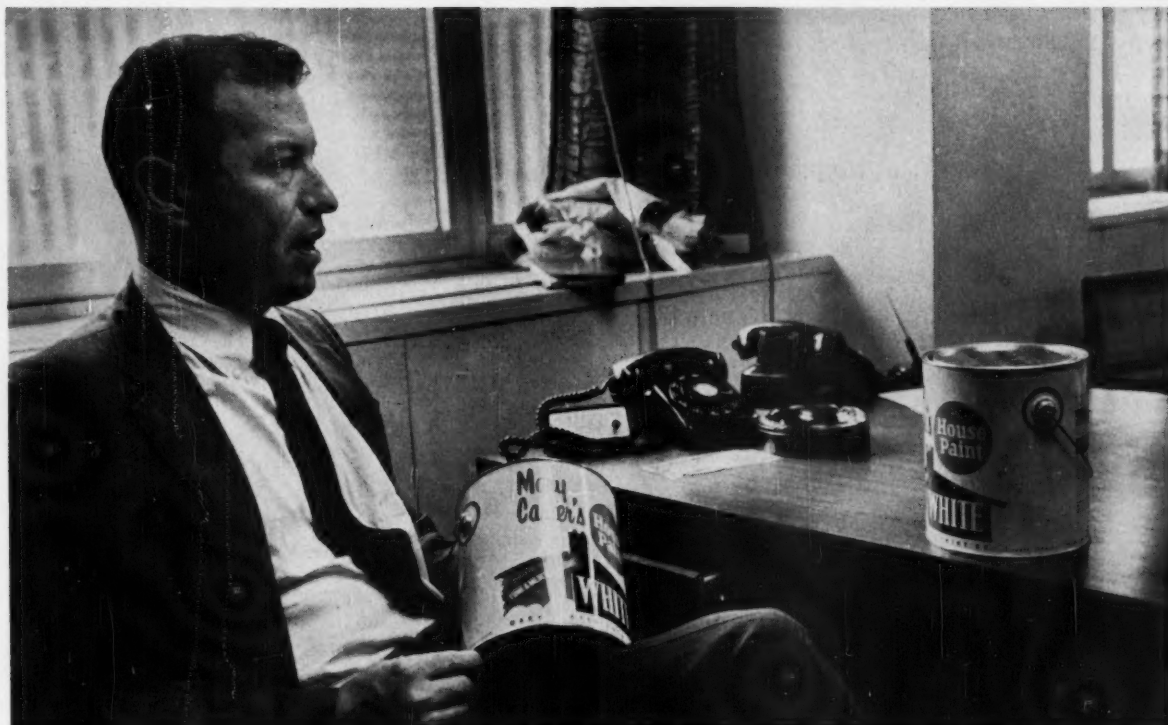
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CW PHOTO—JOAN SYDOW

Mary Carter's Davis: His company's 'two-for-one' paints have started an industry free-for-all.

Maverick Paintmaker Eyes New Markets

In the next few weeks a new paint plant will begin operating in Chino, Calif., for Mary Carter Paint Co. (New York), marking another brisk step in the firm's lively growth stride. As soon as the 1-million-gal./year West Coast unit adds gallonage to three other Mary Carter paint facilities—at Tampa, Fla., Conroe, Tex., and Matawan, N.J.—the firm will start construction of a fifth plant, a 500,000-gal./year unit in Puerto Rico.

And after that, the Mary Carter management will set about replacing the Matawan installation.

In this aggressive fashion, Mary Carter Paint has grown from \$2 million sales in '56 to better than \$12 million in '60, and an estimated \$17 million this year. In that time, the company, which sells its paints under the Mary Carter label in franchised and company-owned stores, has increased its outlets from a total of 46 in '56, selling mostly in the Southeast, to over 700 selling nationwide.

Trade Troubles: But if management and stockholders find the company's progress pleasing, there are others who see it in a different light.

For one thing, the company is preparing to go before the Federal Trade Commission to answer charges that it has indulged in deceptive advertising and merchandising methods. The practices in question—which have been responsible for much of the company's fast growth—pertain to the firm's method of selling paint by the "two-for-one" plan. Under this system, the customer buys one can of paint for the labeled price and gets a second can "free." FTC's complaint states that the second can isn't really free, that the price of the first can is increased so that the customer is really paying for the second can.

This FTC grilling is being closely watched by National Paint Varnish and Lacquer Assn. officials. They have made Mary Carter the subject of a strong attack in the association newsletter, *Coatings*. In that journal,

NPVLA president General Joseph Battley has referred to Mary Carter by sundry names and implications.

Stiff Standards: Mary Carter's way of selling paint is decidedly different from usual industry practices, in ways other than the "two-for-one" plan.

Instead of distributing through wholesalers, the company sells all of its products through franchised dealers and company stores—and permits no other paint products to be marketed through these outlets. The franchised dealer supplies the capital for his store and inventory, adheres to a fairly rigid merchandising standard. The dealer pays cash for the paint, has to buy a minimum quantity (120 gal.) and gets delivery direct from the Mary Carter factory in company-owned trucks. The retailer's markup is 25%, and sales must be on a strictly cash basis with no discounts allowed to the painting trade or any other group. Sizes are standardized at quarts and gallons.

What are other companies' opinions

of Mary Carter's maverick method of selling paints? An official of another paint company tells **CHEMICAL WEEK**, "It looks to me as if Mary Carter has a lot of people to serve as dealers who are either inexperienced businessmen or know nothing of the paint business." Whereas the Mary Carter franchiser works on a 25%-of-gross-profits basis, he says, major paint manufacturers usually offer 35-40%. And where the established paint companies offer credit aids, financial assistance, sales aids and business advice, he adds, the Mary Carter dealer must pay cash for his merchandise, and also must pay half of all local advertising run by the company, which is much higher than is usually demanded by other paint companies.

But if Mary Carter is giving its franchisers a raw deal, there is little sign of unrest. Last year the company almost doubled the number of franchised operations it had in '59 (see chart), and quadrupled the number it had in '58. More impressive, the number of franchised outlets it has added reflects the geographic growth of the company's operations. Originally, franchised dealers were almost exclusively in the Tampa, Fla., area. Now there are Mary Carter stores in 39 states, the British West Indies and Puerto Rico.

Of the \$17 million worth of products these outlets are figured to sell this year, about 90% will come from sale of Mary Carter paints, 10% from sales of related items—brushes, ladders, masking tape, sandpaper, solvents, steel wool and shellacs. (Not all of these are sold under the Mary Carter label.)

The country's best sales area for Mary Carter paints is the Southeast (they've been there longer). Sales in the Northeast (especially Pennsylvania), and the Far West (there are now 40 stores in California), however, are growing faster. Midwest sales, still largely undeveloped, will get a concerted product push, once a plant is built to serve that area. Mary Carter officials also think that Canada (there are no stores there) has potential, but it's likely that they would acquire existing outlets there rather than try to develop new ones.

Top outlet for the company now is a company-owned store in Altoona, Pa. (gross sales: \$150,000/year), followed by another company-owned

store in Jacksonville, Fla. (\$140,000/-year). A number of franchised dealers, however, have sales in the \$100,000/-year area.

A Bigger Bucket: To supply the paint for these growing outlets the company has increased capacity of its plants to 8.3 million gal./year, including the upcoming Chino plant. The company had planned to build two plants—one in the East and one in the Midwest—may instead build a plant to service both areas from an intermediate location.

The company's products have been directed mainly to the \$800-million/year market for do-it-yourself painters. A slight change in that practice will come soon, when the firm brings out a line of paints aimed at commercial users. These products will be sold—exclusively through Mary Carter franchisers—under the Marcar label in large-volume containers (5 gal. to 55 gal.).

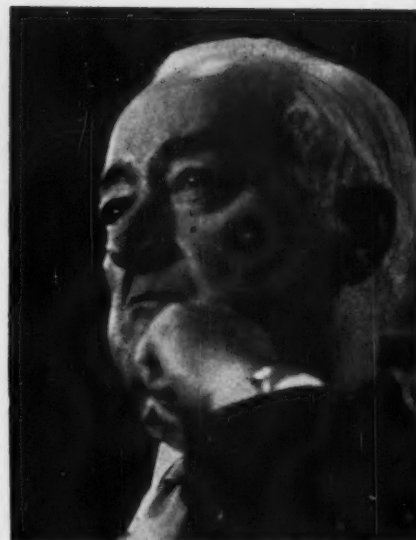
And even bigger changes are contemplated. While Mary Carter products are currently related strictly to paint, the company is considering plans to make and sell products outside the paint field. It has pretty well settled on plans to convert many of its operations from strictly paint-selling outlets to complete do-it-yourself centers—to deal in such items as wall and floor tile, garden supplies (including chemicals), roofing and siding materials and perhaps even lumber.

Tying in with this switch, one that could alter the complexion of the company, is Mary Carter's latest idea: to acquire a chain of stores already serving this interest. Aim: to get the company into this business with a running start.

Such an acquisition, says I. G. Davis, Jr., president of Mary Carter, could well make the company a \$30-million/year concern by year's end. He thinks that sales of \$100 million isn't an unreasonable target for the next five years.

Operation Upgrade: Meanwhile, the company obviously can't afford to shrug off the charges leveled at it by FTC and still carry out its ambitious expansion and diversification programs. First step in countering adverse publicity will be a stout defense of its present merchandising methods.

It's the company's contention that price is today the criterion of quality



CW PHOTO—D. KIRKLAND
NPVLA's Joseph Battley is vocal against Mary Carter's sales practices.

in the paint field. It concedes that, while it could price two cans of paint at its present one-can price (disregarding the "free" can), the public wouldn't accept this, thinking the paint would not be a quality product. And Mary Carter stoutly maintains that it deals in quality products.

The company has pushed other image-building ideas rather successfully in the recent past. In '60, for instance, it obtained the *Good Housekeeping* seal and was included on the American Hotel Assn.'s Certified Products List. Neither of these is actual proof of quality, of course, but both are esteem builders.

In addition, the company is now selecting a national advertising agency to handle the more than \$2 million it will spend this year in promoting its products. About half this will go for beefed-up TV spot advertising.

Who's Who: Getting a clear picture of who's who and who does what on Mary Carter's aggressive management team is almost as difficult as figuring out the company's corporate structure.

At the helm, as president, is young (35) I. G. Davis, a former vice-president of the firm. He switched to Mary Carter from Rheem Manufacturing, where he was director of planning. Before that he was with a marketing management consulting firm. In taking over the reins of Mary Carter last year, he replaced Robert Van Worp, Jr., son of the founder

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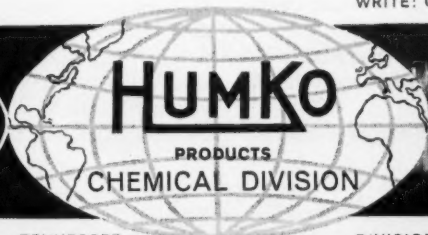
While it is known that oleamide provides polyethylene and polypropylene film with excellent slip and anti-block characteristics, the semi-solid, gum-like consistency of oleamide presents two serious production problems. First, the waxy gum is hard to remove from containers and second, distributing trace amounts of this solid uniformly on plastic flakes requires excessive mixing time. Working with its unique fatty acid processing and its unusually versatile amide facilities, HumKo produced an oleamide (KEMSTRENE

AMIDE U) that is a powder. Now HumKo has developed a dry, powdered, *fully flowable* amide (KEMSTRENE SU) to reduce further the production handling costs and to provide an even distribution of the amide throughout the flakes with minimum mixing time.

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Mary Carter: Growing Through Franchising

	Net Sales (millions)	Net Earnings (thousands)	Franchised Dealer Stores	Company- Owned Stores
'55	\$ 1.3	\$43	5	24
'56	\$ 2.2	\$221	16	30
'57	\$ 3.7	\$411	57	47
'58	\$ 5.4	\$577	125	62
'59	\$ 8.4	\$802	262	63
'60	\$12.4	\$968	456	83
'61 (est.)	\$17	\$1,400	650	90

of the company (who is one of its largest single stockholders).

Chairman of the board is James M. Crosby (also in his 30s), who also is the chairman of the board of Unexcelled Chemical, which shares offices with Mary Carter in New York's Tishman Building. A number of other Crosbys (brothers) and their in-laws (the Murphys) also serve on the Mary Carter board of directors. News commentator, Lowell Thomas, is one of the board members and a large stockholder in the company, as is former New York Governor Thomas E. Dewey.

The Crosbys got into the Mary Carter Paint picture in '58. They used capital gained from the sale of most of the assets of a Berlin, Wis. metal-working firm, Berlin Chapman Co., which was operated by Crosby-Miller Corp.

The Crosbys bought 80% of the capital stock of Mary Carter Paint Factories (from Van Worp Sr., who retained the other 20%) and 100% of the capital stock of Southern Resin Corp., another Florida company started in '56. Southern Resin was liquidated into Crosby-Miller in '59; and a little later Crosby-Miller was merged into Mary Carter Paint Co., as were Mary Carter Paint Factories (in Oct. '60).

Anyone Know Paint? In the Mary Carter management there are few men with long-time paint industry experience. President Davis admits this but doesn't attach much importance to it. He contends that his company has brought to the paint industry some excitement in merchandising and pro-

motion that it has sorely lacked in the past.

Davis believes the industry can do a better job than it has in bringing out new items, do a better job of packaging them, and at the same time give the consumer lower prices. He cites Du Pont's recent promotion of its Lucite thixotropic paint as the kind of thing he would like to see more of. Among the things he thinks could be done: selling more paints in supermarkets ("but not as they are now") and in other nontraditional outlets.

Aerosol Cost Cutter

Water-based aerosols—packed with cheap hydrocarbon propellants—may be in for a popularity spurt. A number of companies have recently come up with technical improvements that make the water-based products more attractive to aerosol marketers.

Nearly all the aerosol contract fillers are working in this area. Continental Filling, Petersen Filling, Stalfort, and Aerosol Techniques, in particular, have contributed, as have such marketers as S. C. Johnson.

A big factor in the water-based field is Sylvan Lefcoe of Par Industries (Los Angeles). He tells CHEMICAL WEEK that his firm and Power-Pak (Bridgeport, Conn.)—both aerosol fillers—have cooperated in developing a broad range of water-based aerosols.

Interested national manufacturers include Lever Brothers and B. T. Babbitt.

One of the major accomplishments

has been the formulation of concentrates that don't corrode cans—achieved with the cooperation of American Can and Continental Can. Key: an Epon (epoxy) coating for the entire can.

The cans also have a 0.06-in. diameter special capillary tube. Considerably smaller than most tubes, it has been characterized as functioning, in essence, as a restricted flow tube. New valves are involved, too. They're being made by Precision Valve (Yonkers, N.Y.) and Aerosol Research (Chicago).

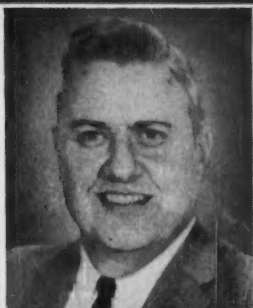
Potential items in the water-based line include hair sprays, paints, insecticides and room deodorants. Lefcoe claims that as much as 95% of present aerosol products could be water-based, and figures that use of the water-based system would cut 5¢/unit from the raw cost of virtually any aerosol item. He also claims that it may be possible to package products with up to 30% water by the use of the new developments.

His remarks stir industry speculation: Will the successful development of such a water-based system loosen the La Maur Inc.'s patent grip on hair sprays? This patent describes an anhydrous system with a fluorinated hydrocarbon propellant; Par's water and hydrocarbon combination seems to be an entirely different product. La Maur is charging ¼-½¢/can royalty (depending on can size) for hair spray aerosol units (*CW*, Feb. 11, p. 69).

Besides getting around the La Maur patents there may be another advantage to water-based hair sprays. They could cut down the amount of alcohol (which has a tendency to dry hair) that is needed in these formulations.

Another product improvement that has already come out of the Par-Power-Pak program is a water-based spray paint. In fact, Par has been packaging a water-base multicolored paint called Dots and Spots for Scientific Coatings Co. for the past eight months.

Until these recent developments, about the only water-based aerosols so far commercialized have been window cleaners, starches and furniture polish. These starches are either emulsifiable natural or synthetics and are low in solvents. Similarly, the window cleaners have few active ingredients.



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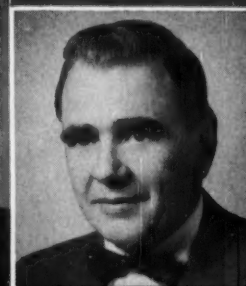
BOB CURTIN
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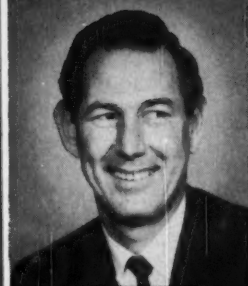
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Coping with Mexico's 'Nueva Tarifa'

U.S. companies selling in Mexico look for ways to live with new tariff law.

After a half century of exporting aromatic chemicals and perfume raw materials to Mexico, International Flavors & Fragrances Inc. (New York) last week set up a Mexican subsidiary company. Main reason for the move—likely to be emulated by other U.S. specialties makers—is to side-step greatly increased duties imposed by the Mexican government in its most recent tariff revisions.

The "protectionist" measure that has so jolted specialties makers went into effect last April. Its prime aim, of course, is to boost local industry.

In general the government now specifies import taxes on individual items, formerly loosely grouped in generic—and often low-duty—categories. For example, all Mexico's imports were listed under 4,000 classifications, whereas the U.S. listed its exports to that country under 40,000.

Looking for a Break: Some of the hefty across-the-board tax hikes on chemicals and drugs—as well as other goods—have brought a flood of complaints to the Mexican government from U.S. companies. Nevertheless, some companies tell *CHEMICAL WEEK* they now find they can get a fair break from the government if their products are not made in Mexico but can be proved necessary to the economy. They also find that the Mexican government is willing to give "temporary" import permits at comparatively low rates on products not now produced locally but slated for Mexican production in the future.

Some U.S. companies that have been considering building Mexican plants think that the new tariff will be an advantage. Others, which will have to import their raw materials from the U.S. even if they do set up a Mexican plant, claim that the already-existing red tape has been multiplied.

Last Resort: IFF says its subsidiary, which now exists only on paper, will by no means solve all of its problems in supplying the Mexican detergent, cosmetics and perfume makers. Since '48 the tariff on perfume ingredients has been increased annually, and this

year's raises alone are 30% in many cases.

By incorporating in Mexico, IFF will be able to get "a reasonable duty" on about one-third of the materials it ships there (including esters, acetates, gums, balsams and crystals). The remainder of its compounds still are subject to what IFF considers extravagant duties. The company will not conjecture at this time just how extensive an operation it plans for Mexico.

Detergents Hard Hit: Two industries particularly affected by the revisions are the detergent and cosmetic industries. Since Mexico has no aromatics industry of its own, all perfuming materials must be imported. Consequently, Mexican soapers, many of them subsidiaries of U.S. companies, will be forced to buy imported, high-priced aromatics. And relief in the form of price increases at the consumer level is not possible because the government has fixed the price of soaps and detergents.

Some soapers—e.g., La Corona and Colgate—are selling detergent in bulk quantities and retailing it by the scoopful to maintain their profits (*CW*, April 8, p. 63).

Cosmetics, toiletries and perfumes are also faced with crimping hikes in duty, as much as 100% in some cases. This, some Mexican producers feel, will completely cut off imports of these items.

Few Reductions: Although there were hundreds of tariff raises affecting specialties such as vegetable dyes and tanning materials, lubricating oils, coloring materials, paints and varnishes, medicinals, essential oils, cosmetics, adhesives, deodorants, etc., a few reductions were made—e.g., on vinyl resins, tires and whisky. Rat poison compounds got an across-the-board exemption because cities in northern Mexico have been plagued by rats.

Monsanto and Goodrich, which produce vinyl resin in Mexico, could be hurt by a new flood of imports as a result of the resin tariff cut.

There is, however, good reason to

believe that the Mexican government will change its decision because of the effect this tariff reduction would have on local manufacturing. But if the reduction sticks and imports rise, Monsanto's Mexican resin production may have to cease.

Goodrich tells *CW* that it is "quite disappointed in the Mexican government's action." The company says it hopes the government will reconsider and change its policy. There is some indication that the government has already reconsidered. It is reported that an order temporarily setting aside the tariff increase has been issued.

Hardship Cases: Most chemical products have undergone sky-high tariff increases. Adipic acid, for example, not manufactured locally, formerly had a tariff of 1 centavo/kilo, plus 4% ad valorem. Revisions rocketed the product's tax to 25 pesos/kilo, plus 40% ad valorem. One company importing it, a Celanese affiliate, has been forced to send back some imported shipments. There may be some revision of this tariff, too, because adipic acid is needed for nylon production.

U.S. drug companies have not been hit hard because of Mexico's great need of pharmaceutical products. In most cases, of course, drug firms can prove their products are required for public health. Upjohn, for example, soon to start production in Mexico, feels it will not be hurt at all.

Closing Loopholes: Over-all, the revisions will likely have good effects. Mexico will have better classification and breakdown of its imports and should pick up much-needed extra cash. (Last year it had a \$75-million balance-of-payments deficit.) Previously inefficient and inaccurate, Mexican import regulations now have closed enormous loopholes.

Although many companies will be thrown off balance temporarily by the new rules, most will be able to prosper, either by getting tariff revisions or by modifying their operations. Practically the only specialties companies that may be seriously hurt are those doing strictly import-export business. Those with local production plants stand to benefit eventually.



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SPECIALTIES

EXPANSION

Fluoride Firm Bought: American Fluoride Corp. (New York), manufacturer and distributor of insecticides, rodenticides and fluoride compounds, has been acquired by Alexander M. Phillips and Harvey W. Rambach. The company will be affiliated with Rambach Chemical Co. and American Firstoline Corp.

New Division: Dyna-Therm Chemical Corp. (Culver City, Calif.) has established a new division to market high-temperature coatings and insulating materials. Its line will also include heat-resistant papers, urethane potting compounds, and lightweight interior partitions.

PRODUCTS

Epoxy Paper Laminate: A new grade of copper-clad epoxy paper-base laminated plastic for printed-circuit manufacturing is being marketed by National Vulcanized Fibre Co. (Wilmington, Del.). It's said to have improved flexural strength, cold-shearing and flame resistance superior to conventional epoxy paper laminates, and better electrical properties than XXXP grades. Tradenamed Phenolite Grade EP-492-1, it is furnished in two sheet sizes: 39x39 in. and 39x47 in. Cost is about \$1.55/sq.ft. in 1/8-in. thicknesses with 1-oz. of copper on one side.

Epoxy Resins: Heyden Chemical Division of Heyden Newport Chemical Corp. (New York) has started commercial production of the first of a group of new epoxy resin chemicals—liquid polyamide resins used as curing agents. Identified as Pentamid and Pentamid 2, the polyamide resins are produced by the condensation of polymerized fatty acids and polyamino compounds.

Aluminum Cleaner: A non-silicated, mildly alkaline soak cleaner for non-etch cleaning of aluminum prior to anodizing, chromating, bright dipping and electroplating, is being offered by Enthone Inc. (New Haven, Conn.). It's called Aluminum cleaner NS-35 and comes as a powder, to be dissolved in water at 2-8-oz./gal. The product, shipped in fiber drums, is priced at 17.5-19¢/lb. depending on quantity.



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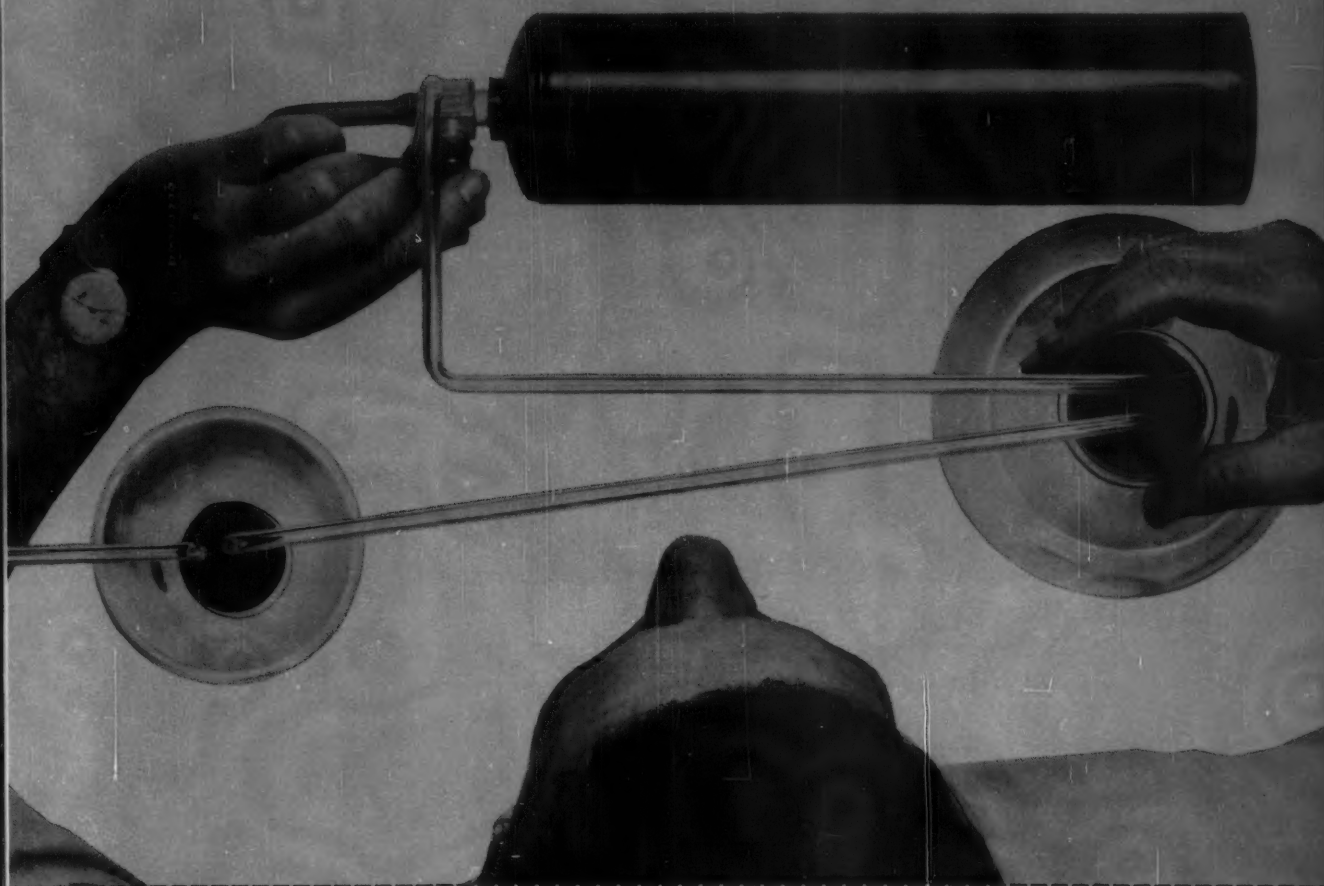
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Washington Newsletter

CHEMICAL WEEK
June 24, 1961

A 7% across-the-board tax credit on new plant and equipment

is gaining momentum in Washington, in both the Treasury and the House Ways & Means Committee. It would be a substitute for the Administration's more complicated tax credit plan, which evoked almost solid opposition from business firms during hearings before the committee. Under the substitute plan, a company would be allowed to subtract from its annual tax bill 7% of the amount it spent that year on new plant and equipment.

The feeling is that President Kennedy would accept the new plan. Fiscal experts estimate that it would cost the Treasury about the same as the Administration plan—\$1.7 billion/year. The real clash between Congress and the White House would come if (as expected) the House rejects the other parts of the Administration's tax package—designed to offset the \$1.7-billion revenue loss (by tightening tax rules on overseas profits, putting a withholding tax on dividends, repealing the 4% dividend credit and tightening rules on business deductions).

Complexities in the President's tax credit plan are cited by the Manufacturing Chemists' Assn. as the reason for its opposition. In a letter to Chairman Wilbur D. Mills (D., Ark.) of the House Ways & Means Committee, MCA says the Administration's proposal "might well multiply some of the uncertainties of corporate management." It could be helpful as a stopgap measure, the letter states, but, "in our opinion, over-all depreciation reform is badly needed."

Such reform may come—but not until next year at the earliest. Even the 7% tax credit plan would be a stop-gap measure. The Administration and Congress both are planning consideration of over-all tax structure reform—including depreciation allowances—in '62.

MCA also opposes most of the rest of the President's tax package. It says his proposal to tax immediately the earnings of overseas subsidiaries would "have a deterrent effect on continued growth of the chemical industry here and abroad." Much the same would be true, it contends, if Congress approves Kennedy's plans to withhold taxes on dividends and interest and to set a limit on deductible travel and entertainment expenses. These seem to be dead so far as this session of Congress is concerned.

Coal industry hopes for a study of federal fuel policies have dimmed somewhat. What coal people want is a well-financed study by a special Senate committee so they can argue for a sharper curb on East Coast imports of residual fuel oil imports and against so-called "dump" sales of natural gas for industrial use during warm months. But Sen. Clinton P. Anderson (D., N.M.) disclosed last week that he would prefer

Washington Newsletter

(Continued)

such a study by the Senate Interior Committee he heads. And he probably will get his way.

Coal spokesmen argue that a standing committee—such as Interior—doesn't have the time or the broad representation to conduct the kind of study they want. If Anderson gets his way, the coal industry will turn to Speaker Sam Rayburn (D., Tex.) in the House. He is sitting on a committee-approved resolution to create a select House committee to make such a study. He held up action to see what the Senate would do.

•
A nationwide inquiry into the handling of prescription drugs given to physicians as samples has been started by the Food & Drug Administration. The investigation is a direct result of two recent seizure actions by FDA, based on the alleged repackaging for sale of hundreds of thousands of free samples of potentially dangerous prescription drugs originally prepared for distribution to physicians.

Proceedings have been filed by FDA in U.S. district court against Marshel Sales Co. (Palisades Park, N.J.), and Fall Drug Co. (Jersey City, N.J.). FDA charges the repacked articles include Diuril, Hydrodiuril, Chloromycetin, Aureomycin, Terramycin, Equanil, Placidyl, Premarin, Thorazine and numerous other drugs. The repackaged drugs were not labeled properly, says FDA.

Sen. Estes Kefauver (D., Tenn.) promptly got into the act. He said "we've had considerable information" about such abuses. Kefauver undoubtedly will take up the subject when his Senate Antitrust & Monopoly Subcommittee holds hearings next month on a bill to impose stiff controls on the drug industry.

•
Some chemical fire inhibitors are more effective when applied to the air around the flame rather than to the burning fuel. That is the indication from a study conducted by the National Bureau of Standards. It is conducting the study because increased use of high-energy fuels by the military services has emphasized the need for improvement of existing fire extinguishing agents and development of new ones. Inhibitors used are methyl bromide and trifluoromethyl bromide.

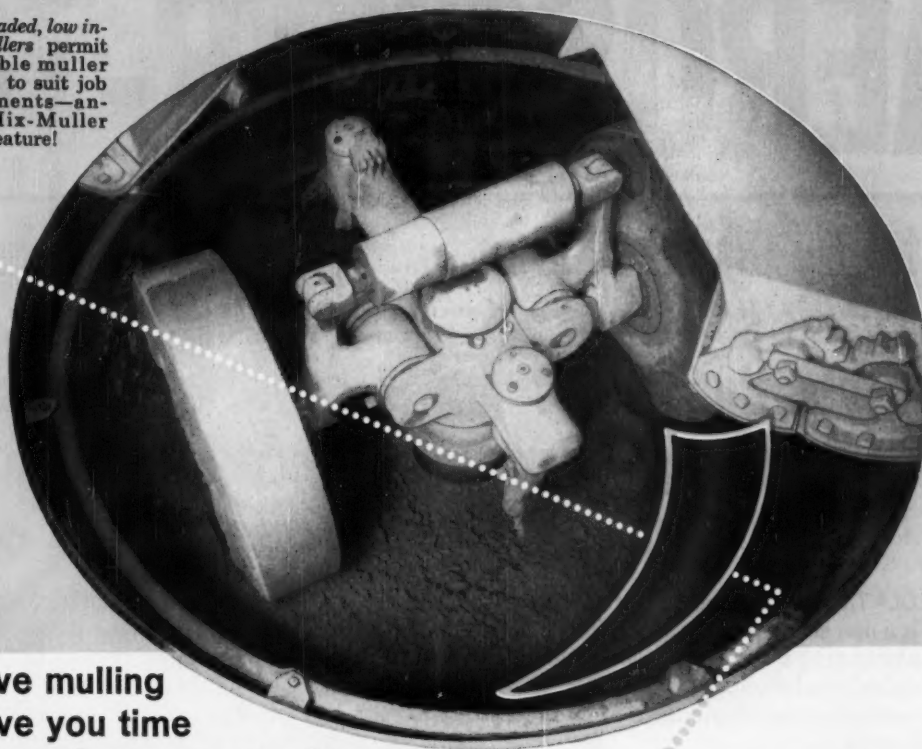
•
No policy change is imminent in the sale of rubber from the government stockpile. Reports of such a possible change stem from a desire on the part of the General Services Administration to sell more rubber in anticipation of deterioration of quality. GSA sells rubber on a sliding scale, depending on the market price. When the market drops below 30¢/lb. its sales must end.

GSA officials have conferred frequently with officials of the State Dept. and the Office of Civil and Defense Mobilization on the subject. These two agencies oppose any step-up in sales, fear such a move would upset the market. Their view has prevailed so far.

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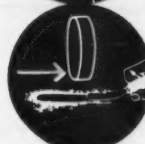
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Grace's Kelsey (left), Hanigan chart investor relations program.

CW PHOTO—W. ROSENBLUTH

Making Money Talk

This week W. R. Grace & Co. handed the title of director of investor relations, first of its kind in the firm's 107-year history, to Assistant Treasurer John F. Kelsey, Jr., charged him with the responsibility of keeping the public informed about Grace's financial progress.

Treasurer Kelsey's job primarily is that of financial public relations (FPR) — a management function that is growing in stature not only at Grace but throughout the CPI.

The aim of FPR, simply stated, is to keep stockholders, the financial

world and the general public well informed about company matters related to finance. It encompasses such things as producing the annual reports (and related publications), setting up a company's presentation before financial groups, helping with raising capital and keeping a company's stock status on an even keel.

Having a special group do this can be costly—for example, \$35-50,000/-year for a company with \$100-million/year sales. But it can be of great help in smoothing out problems with stockholders and potential stockhold-

ADMINISTRATION

Financial public relations:

it is good business

but it can't

do the work of profits.

ers. Grace's FPR problem is more complicated than many. Known most of its corporate life as a steamship company, Grace now derives three-fourths of its more than \$16-million consolidated net income from chemicals — ammonia, fertilizers, resins, packaging materials, urea, etc.

But Grace's 31,000 stockholders (about 4.7 million shares of common stock are outstanding) have not all been fully aware of the company's chemical holdings. And even the 30,000 people in the financial community, which includes 6,000 security analysts and investment advisors as well as stock brokers, bank trust departments and institutional investors (e.g., foundations, mutual funds, insurance companies, investment trusts, pension and union welfare funds) have been slow to realize the change.

As a result, Grace stock has sometimes been underpriced by chemical stock standards. From a low of 35¼, this year, Grace common climbed to 75½ before tapering off somewhat. Earnings were \$3.22/share last year, but the stock's price-earnings ratio has hovered as low as 11. That's not an abnormal ratio for a steamship company, where growth prospects are considered slim, but it is out of line for a successful chemical producer. Large, diversified chemical companies, for example, have traditionally posted ratios of 20-25 (Du Pont, Union Carbide, Allied, American Cyanamid). It points up Kelsey's job.

Joint Effort: Kelsey's new assignment will be to accelerate a program Grace management has begun. The chores, of course, encompass more than altering a corporate image.

In any large company, PR is a two-way communications task. Management must be kept informed about the opinions of the company's various "publics," which include not only stockholders, potential stockholders and the financial community but also employees, suppliers, customers and

various government bodies. Public relations practitioners must also advise management concerning best courses of action in these cases. U.S. companies now spend more than \$2 billion annually on corporate PR.

Symbols Shifting: But techniques of Grace's new image-building illustrate some special aspects of FPR. One program concerns altering the trademark from the familiar green pennant to a green rectangular symbol that resembles the pennant but does not have the latter's steamship company connotations. The firm has also launched *Chemical News Letter* for dissemination of news of products, research and the corporation to the press as well as to other corporate contacts. FPR's role in reshaping an image is difficult to divorce from any other PR activities in this connection. So Kelsey, while reporting to Grace Vice-President Thomas E. Hanigan, Jr. (assistant to President J. Peter Grace), also works closely with the firm's public relations division, of which Richard L. Moore is director.

Grace's investor relations team is employing practically all the activities required for a full-blown FPR program. While the New York Stock Exchange (on which Grace is listed) and the Securities & Exchange Commission have set up minimum requirements for disseminating financial information about publicly owned companies, they endorse programs that go beyond the essentials. Many publicly owned CPI companies, like Grace, work harder at these FPR functions than is formally required.

Top of the List: Annual reports head the list of FPR devices. Some essentials required of an annual report are that it give a statement of income, include a balance sheet, notes and an auditor's certificate, and be circulated to stockholders. Pertinent information is released to the press simply by giving it to newspaper wire services and metropolitan newspapers carrying financial pages.

When the annual report is used as an FPR medium, however, it includes as much information, both in text and illustration, as possible. Grace helped make its point about being a chemical company in its '60 annual report. The cover and theme emphasized its chemical effort. Only one of its 32 pages described ocean transportation operations.

For maximum effect, FPR experts advise wide distribution of the report to stockholders, the press, members of the financial community, and university and college libraries. They encourage distribution by the company treasurer to banks in regions where the company has interests, and recommend a special annual report for employees.

FPR also often suggests publication of three quarterly reports (sometimes a fourth); preliminary release of annual report figures; news stories on the report prior to its distribution; immediate announcement of dividend activities to the press; dividend enclosures (frequently stressing a particular product for which stockholders might make good customers); photos and biographies of director candidates in proxy statements; and acknowledgement of the receipt of proxy statements by management.

Getting Together: Annual meetings can provide broad opportunities for wooing stockholders. Hill & Knowlton, Inc., New York PR agency that lists Procter & Gamble and American Potash among its CPI clients, offers some basic FPR tips—some of which show why the FPR tab runs so high. To encourage stockholders' attendance it recommends a separate invitation in addition to announcement of the meeting in the annual report; emphasis on a convenient location (which may be rotated annually among major cities, if there is a justifiable number of scattered stockholders); closed-circuit TV network to bring the meetings to other cities;

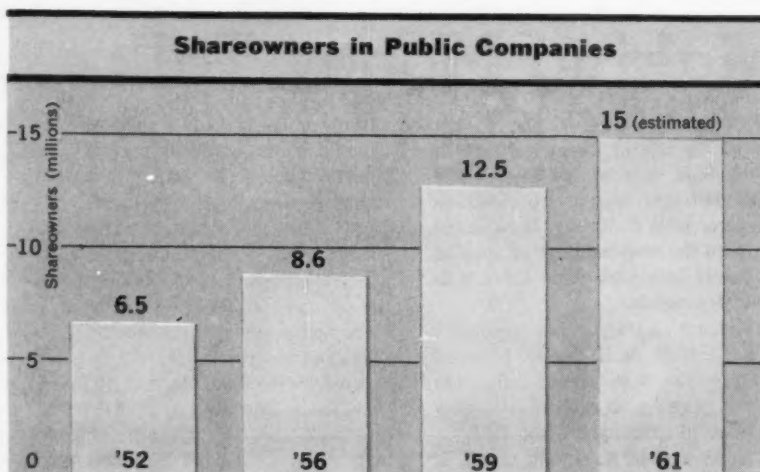
plant tours for stockholders; exhibits of products and free distribution of a typical, low-cost item to stockholders; transportation and lunch.

Relations with "professional stockholder" groups (such as those headed by Lewis Gilbert and Wilma Soss) are a special FPR problem. But alert FPR helps anticipate reasonable questions so that company officers have well-thought-out answers in the event questions are raised at meetings.

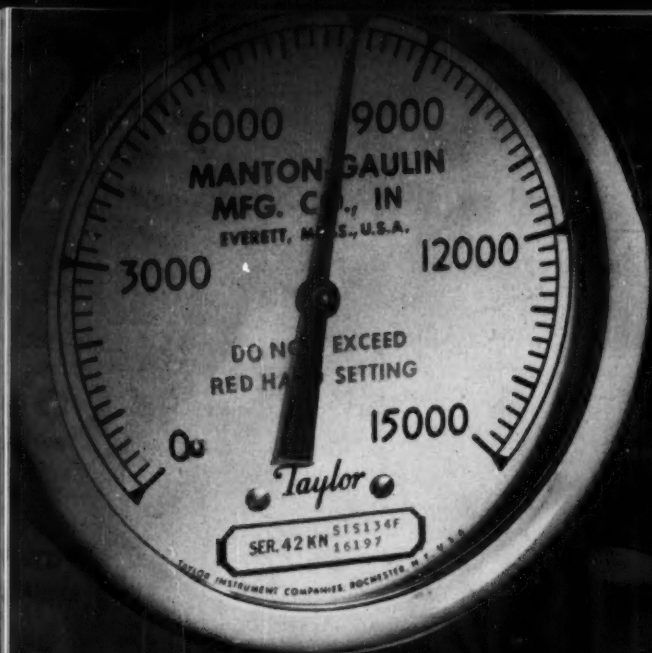
Grace's recent meeting illustrates some of these points: it held its annual meeting at its \$6-million Clarksville, Md., chemical research center this year. This emphasized chemical aspects, gave an opportunity for the firm to show off new product research on smog control.

Second Look: Some companies distribute illustrated postmeeting reports to stockholders and others. Among these is The Fluor Corp., Ltd. (Los Angeles), which includes good and bad news in its follow-up report. A sample from the '61 meeting—stockholder W. E. Archer: "You state that you expect to resume payment of dividends. Will these probably be on the same rate as they were paid before, or more or less?" President J. S. Fluor candidly replied: "I don't believe that we would start on the same basis as before, which was 30¢ a share quarterly."

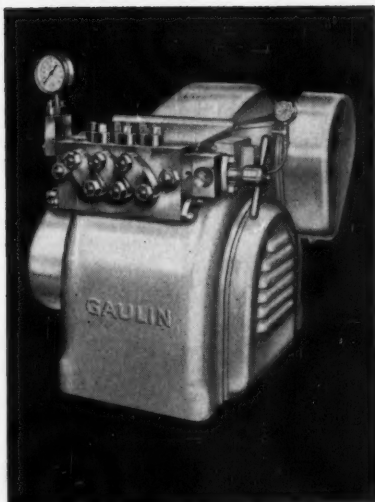
Fluor's frankness in discussing its financial reverses is a trait that rates high with security analysts, who in turn are rated prime contacts by all FPR practitioners. Fluor, unlike Grace, feels that its task is one of es-



Source: New York Stock Exchange



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Capacities from 50 to 7500 GPH . . . pressures from 500 to 12,000 PSI.

See your *Chemical Engineering Catalog* for the name of your local Gaulin representative.



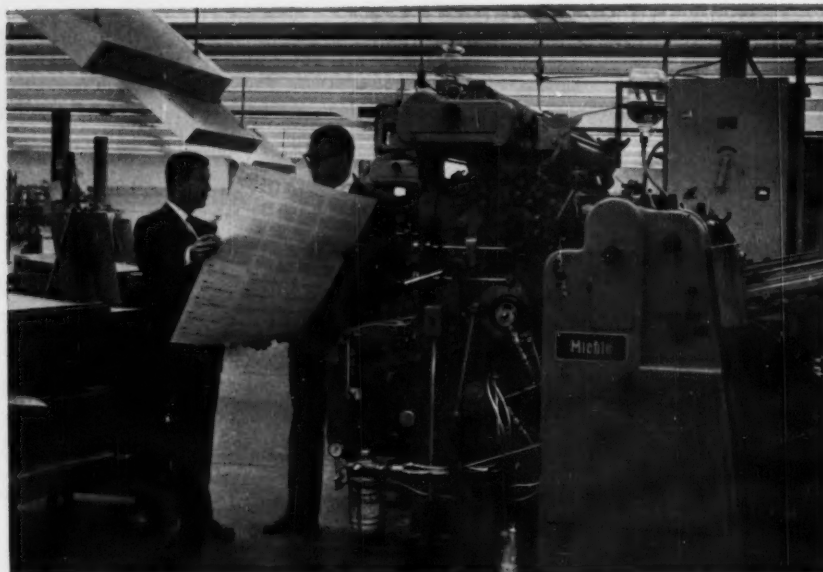
**MANTON-
Gaulin**

MANUFACTURING CO., INC.
72 Garden Street, Everett 49, Mass.

A financial public relation man's



Executives Edwin Cunningham (left), Irving Smith are key sources of figures.



Monsanto Chairman Charles Allen Thomas talks with C. Judd Holt, manager of financial communications. At printer (right), Holt inspects dividend insert.

tablishing, rather than changing, an image. Listed on the New York Stock Exchange since '57, Fluor is still relatively unknown to the nation's 15 million investors.

In '57, Fluor set up an FPR program based on a system of regular communication with a select list of security analysts who specialize in fields related to Fluor's areas of interest (e.g., plant construction). PR chief William Walker and his assistant, Paul Etter, contact about 80 analysts, visit with about 20 of them individually each year. All the analysts get the company's sales and earnings reports and other literature.

And one or more of Fluor's top executives delivers a progress report to an analyst group each year.

Despite poor performance in '59 and the first half of '60, Fluor chose not to depart from its policy of keeping the analysts fully informed (*CW*, March 26, '60, p. 87). At that time, the news Fluor reported was bad. Its stock prices, already falling before the meeting, took a further dip. But shortly afterward business began to pick up. By Dec. '60 the stock had climbed back near its "good times" mark of 26, went to a high of 34½ this year after a bright first-quarter report, and is currently around 31.

Part of this prompt response by investors is undoubtedly due to Fluor's enlightened FPR approach. Says one analyst, "I wish some other companies would adopt the same approach. They tell us about themselves only when times are good."

A cardinal FPR rule, according to Burson-Marsteller Associates, Inc. (New York): "Don't surprise anybody." Keeping the financial community posted on a company's downs as well as its ups avoids sharp swings in its stock prices.

Abrupt drops tend to panic institutional investors; sharp rises encourage speculation that can injure stock-

duties are many and varied.



With PR Dept.'s John Walsh, Holt screens pictures for use in "Annual Review."



Holt keeps up with new construction (left), other corporate gains, consults often with Monsanto management, finds good part of his time is spent at desk.

holders when the price drifts back to normal. In fact, FPR may even be called on to help settle a situation that's soaring a stock's price beyond practical levels based on potential earnings, etc.

Keeping stock specialists informed about corporate operations is also a good idea, FPR counselors agree. The specialist is a broker on the floor of an exchange; he makes an orderly market in the particular stock he handles. The more he knows about a stock, the abler he is to judge it.

Details, Details: A great many details occupy the attention of the FPR team. They supply the professional

touch in communications pertaining to new stock issues, prospectus preparation and distribution, redemption of securities, and stock splits. Also, they are expected to maintain liaison with the business and financial press, arrange press tours, write releases.

In proxy contests, FPR may tackle the assignments of publicizing management's viewpoint, clearing proxy material with the Securities & Exchange Commission and retaining professional proxy solicitors. At all times, alert FPR implies maintenance of proper security concerning information prior to its release.

Security Warning: This question of

security is currently one of the more troublesome FPR problems. Timing the disclosure of financial news so that certain publications get "lead time" necessary to compete with newspapers, radio and TV has come under fire by the New York Stock Exchange.

A recent memo by NYSE President G. Keith Funston cautioned presidents of companies listed on the exchange about this practice: "... apparently through inadvertence [some] important corporate news has been handled on a 'hold for release' basis. While this may be a customary and desirable practice for



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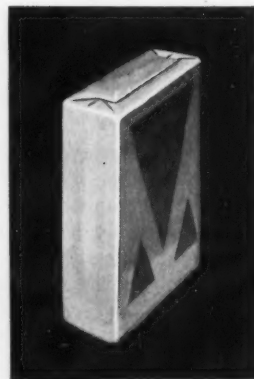
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ADMINISTRATION

certain types of information . . . any news that might affect securities values must be for immediate release."

Promotion Curb Coming? Use of publicity to boom stock prices is under continuing fire by SEC. An SEC release (No. 113) in April covered proposed Rule 206(4)-1, which would "prohibit an investment advisor from publishing or circulating, or from causing any other person to publish or circulate, any advertisement that the rule defines to be fraudulent, deceptive or manipulative." FPR staffs generally do not find the proposal objectionable, since their practice is founded on ethical standards. Besides, they philosophize: "You can't fool Wall Street for long."

Basically SEC's proposal is to shore up the Investment Advisors Act of 1940, since amended, pointing out that "Investment advisors are generally required to adhere to a stricter standard of conduct than that applicable to ordinary merchants. Securities are 'intricate merchandise' and clients or prospective clients of investment advisors are frequently unskilled and unsophisticated in investment matters . . . the proposed rule is intended to [foreclose] the use of practices which tend to mislead or deceive such persons."

The new proposal isn't to be construed as a damper on normal FPR operations, however. SEC is on record as encouraging the trend "to give publicity through many media, concerning corporate affairs, that goes beyond the statutory requirements."

FPR Boom: PR has become an integral function of management in the short space of 25 years. FPR has had concomitant growth. Three out of four major corporations now have PR departments, which may or may not (Grace's doesn't) work with outside PR agencies. The *Financial Publicists Directory*, published by Dealers' Digest Publishing Co., Inc. (New York), lists several hundred financial publicists, public relations counsel firms and advertising agencies.

Behind this FPR growth is the spurt in the numbers of shareowners in the U.S. (see graph p. 72). These investors have more than doubled in number (to an estimated 15 million in '61) in the past decade. According to New York Stock Exchange figures, the number of chemical stock owners is probably increasing proportionately.



NYSE President Keith Funston calls for a halt of financial news leaks.

Holders of record of common stock in CPI companies listed on NYSE rose from 1,650,383 in '59 to 1,908,111 in '60, up 15.6%. (One person may own shares in several companies, so it's difficult to correlate these figures with the true number of individual shareowners. But the trend is probably the same.) NYSE's chemical category includes industrial (e.g., Du Pont, Dow); household (e.g., Colgate-Palmolive, P&G); agricultural (e.g., American Agricultural Chemical); glass (e.g., Corning Glass Works); and drugs and cosmetics (e.g., Bristol-Myers).

The shareowner uptrend may be further helped by the pending opening of a new stock mart, The National Stock Exchange (New York), where over-the-counter stocks will be listed and traded.

Keeping the interest of shareowners and potential shareowners, most of whom are also becoming more sophisticated about stock dealings, is the big aim of FPR. CPI companies, historically considered growth prospects, may have lost some of their luster, and many must now battle to keep their favorable investment image. Sound management, healthy profits, research and expansion are needed to attain this objective. Keeping outsiders informed about such progress is the role that sound FPR can perform.

COMING YOUR WAY

THE NEW PFIZER

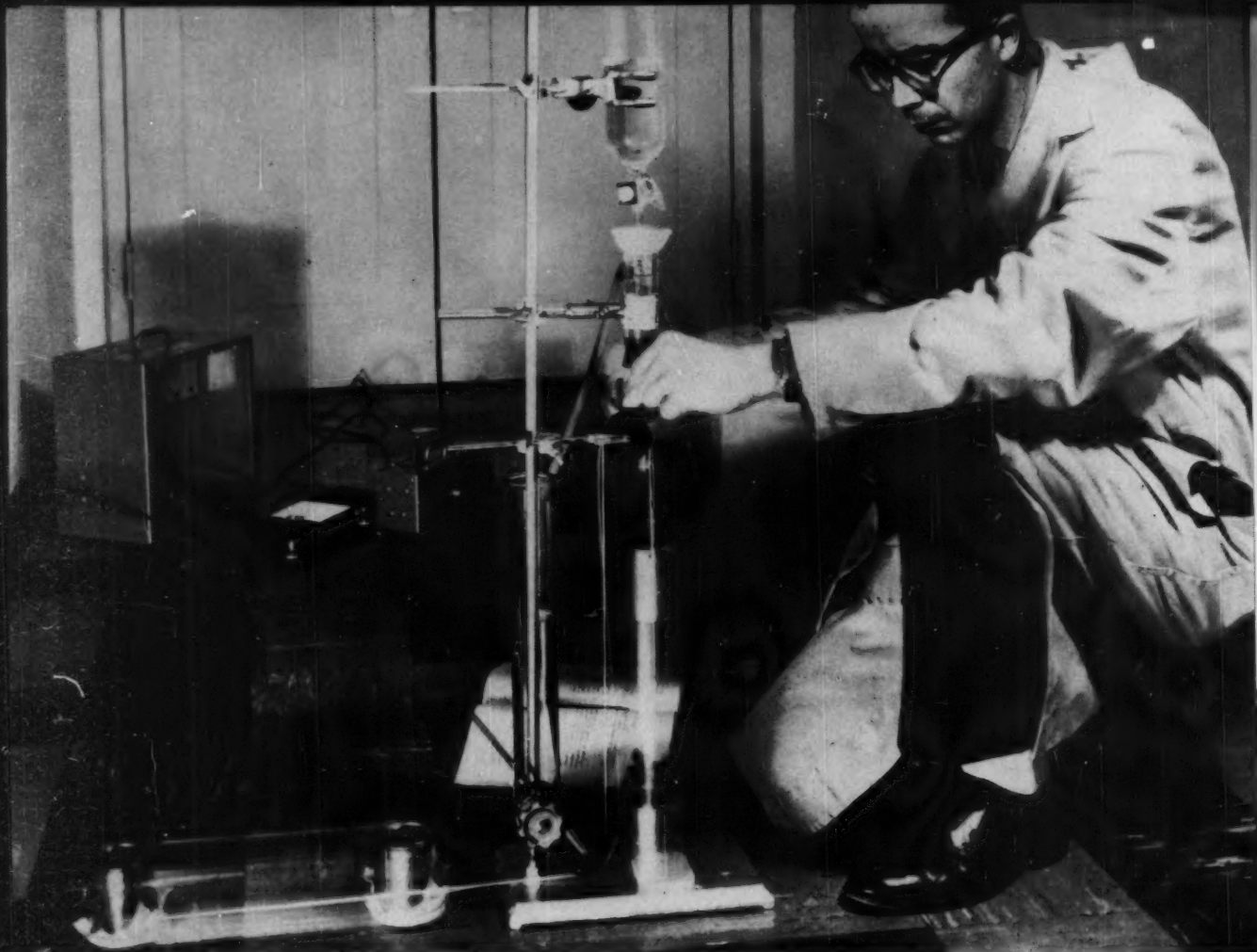
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Unique slip test proves value of Nevillac[®] as wax modifier

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This is but one example of the great versatility of the Neville family of hydroxy resins. They present the formulator with a range of film hardness and plasticization through a choice of softening points. The Nevillac

resins are so widely compatible with a host of other materials, that they often act as agents in bringing together materials normally incompatible. Nevillac also offers lower hot-melt blending temperatures than most synthetics, possesses permanent plasticity, good light stability and ease of emulsification. In addition, Nevillac imparts added tack and adhesion properties to compounds and accentuates resistance to acids and alkali.

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Jobless Aid

Employment patterns in the chemical industry illustrate the reasons for the Kennedy Administration's new proposals for training the unemployed and the underskilled for a place in automated industries.

The revealing figures on the CPI were released last week by the Bureau of Labor Statistics. They show that while the industry has been adding to its total work force, it has been trimming the lists of semiskilled production workers. The figures:

- Total employment in chemical and allied industries in May rose 100,000, to 881,000, a 2% gain over May '60.
- Chemical production workers, employment in May dropped 0.6%, to 538,900. Over the year, this was a decline of more than 7%.

This trend, very clear in the highly automated chemical industry, worries Administration officials. They point out that even with the nation's business on the upswing, and the over-all jobless picture improving, some 3 million workers fit into the "hard-core" of the unemployed—those out of work 15 weeks or longer. Many are being displaced by automation. It's this group, particularly, that the Administration seeks to help by legislation that would provide some \$700 million over four years to teach new skills to 50-60,000 workers annually.

The hope is that, with training, the semiskilled blue-collar worker can be given the higher skills demanded in fields where jobs are increasing—notably among the white-collar and professional jobs and service fields.

The Administration's proposals, now before Congress, would provide federal funds to help pay for:

- On-the-job training, where federal payments would be added to employer funds to pay a maximum \$46/week for 52 weeks of training for higher skills.

- Vocational training, where the government would match state unemployment compensation payments for a year's schooling for the unemployed.

Under the proposal, the Secretary of Labor would tap workers—choosing first among unemployed over 30 years of age who are heads of families—who are susceptible to such training. In addition, it wants to relocate workers—by paying half their

moving costs—to areas where jobs may be available.

Because the program is directed at workers already displaced because of a lack of skills, the retraining would be mainly for the lowest skills demanded of automation. However, part of the program will be directed at the underskilled, those workers who already have some training but need upgrading for more technical assignments.

LEGAL

Cutter Update: Cutter Laboratories (Berkeley, Calif.) has settled 28 polio damage suits for a total of \$1,226,900, according to attorneys for the pharmaceutical firm. About 20 court actions still on file seek millions more. Originally, 50 suits in behalf of polio victims asked more than \$10 million in damages. They charged Cutter marketed faulty Salk antipolio vaccine in '55. Juries in test cases in Oakland, Calif., have found Cutter innocent of negligence in manufacture of the vaccine but have awarded damages to polio victims on a breach-of-warranty clause.

Tax Setback: A bill that would have exempted certain chemicals used in manufacturing from Iowa's 2% use tax has been vetoed by Gov. Norman Erbe. Materials used in interstate commerce are exempt from the use tax, under Iowa law, and this was traditionally construed to exempt raw materials brought in for processing and destined for consumption outside the state.

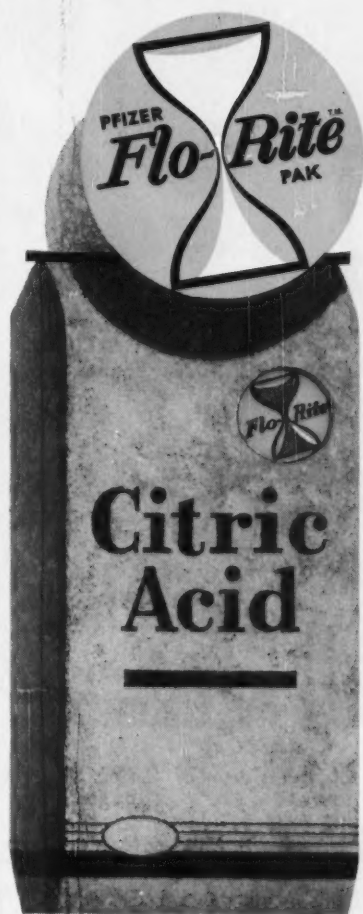
However, three years ago the Iowa supreme court ruled there was a taxable moment if these materials came to rest before being processed. Several bills specifically exempting industrial materials were introduced in the '61 legislature; only one, backed by Iowa chemical processors, passed.

The vetoed measure called for exemption of "industrial material which is to be used and consumed or depleted directly in the actual fabrication, compounding, manufacture or production of other tangible personal property." Gov. Erbe said the language is so broad it could result in exemptions far beyond the intent of the legislature, and the state could not afford to lose an estimated \$1 million in use tax. Erbe said he is in accord

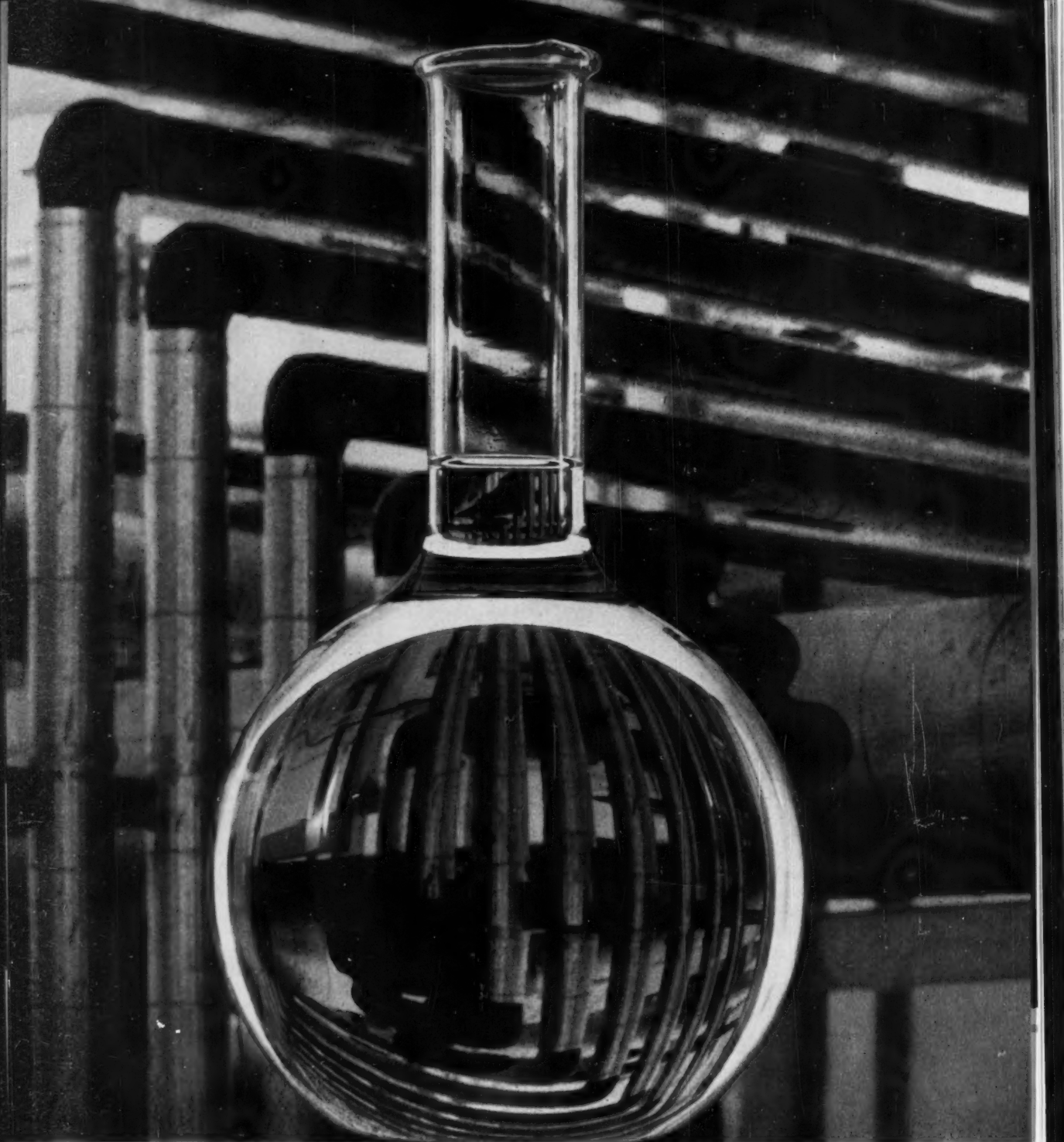
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ADMINISTRATION

with the principle of the bill, however.

Among firms directly affected by the veto are Clinton Corn Processing and a Du Pont plant at Clinton, Iowa. Representative Lawrence Carstensen of Clinton, one sponsor of the vetoed measure, said new legislation will be introduced in '63, "in language more satisfactory to the (tax) commission."

LABOR

Settlements: Local 206, United Cement, Gypsum and Allied Products Union (AFL-CIO), at Celotex Corp. Gypsum, O., plant has accepted a 5¢/hour raise this year, plus 6¢/-hour next year and a \$5 weekly increase in sick benefits.

• A 2% general wage increase for more than 20,000 employees of 46 pulp and paper mills has been submitted to a membership referendum of the two unions involved. Agreement on the increase was reached in Portland, Ore., by negotiators for the Pacific Coast Assn. of Pulp and Paper Manufacturers, the United Papermakers and Paperworkers, and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

• United States Rubber Co. and the United Rubber, Cork, Linoleum and Plastic Workers (AFL-CIO) have agreed on a new two-year master contract and wage pact covering 25,000 workers. The wage agreement calls for a 7.5¢/hour increase effective June 5 for employees of the company's five tire producing plants and a 7¢/hour raise on June 11, '62. Employees of 12 other plants get 3.5¢/hour more effective June 5, 4¢ on June 11, '62.

• Allied Chemical Corp.'s National Aniline Division has agreed on a two-year contract with union employees at its Hopewell, Va., plant. The new contract, ratified by Local 591, International Chemical Workers, provides 2½% across-the-board pay boosts for '61 and '62, retroactive to April 16. Effective the second year of the contract, employees will receive double time and a half for all hours worked on a holiday. The new contract includes compensation for time not worked because of jury duty; extension of existing disability insurance benefits from 13 to 26 weeks; and a provision that if a worker's lunch hour is interrupted by the company, the company must pay for the lunch.

KEY CHANGES

Gerald W. Blakeley, Jr., to the board of directors, Pennsalt Chemicals Corp. (Philadelphia).

Harold C. Urey to the board of directors, Deuterium Corp. (New York).

John W. Brownley to vice-president, Industrial Rayon Co. (Cleveland), division of Midland Ross Corp.

Enrico Pelitti to manager, Phosphate Division, The Chemical and Industrial Corp. (Cincinnati).

Arthur Hanisch to vice-president and member of the board of directors, Atlas Chemical Industries, Inc. (Wilmington, Del.).

William D. Kohlins to vice-president, Podbielniak, Inc. (Chicago), division of Dresser Industries, Inc.

Robert W. Garret to assistant to the president, California Chemical Co., Ortho Division (Richmond, Calif.).

C. Milton Tanner to chairman of the board, **C. Sumner Tanner** to president and treasurer, textile chemical maker Charles S. Tanner Co. (Providence, R.I.).

E. O. Ohsol to vice-president, chemical equipment maker Haveg Corp. (Wilmington, Del.).

James M. Cloney to general manager, Ozalid Division, General Aniline & Film Corp. (New York).

Henry A. Hill to president, Riverside Research Laboratory (Cambridge, Mass.).

Howard T. Cusic to president and chief executive officer, **Maarten W. Oudegeest** to chairman of the board, U.S. Polymeric Chemicals, Inc. (Stamford, Conn.).

Gary G. Grant to general manager, Industrial Division, Lever Brothers Co. (New York).

Albert A. Hazan to vice-president and general manager, chemical distributor Evra, Inc. (Los Angeles).

John W. Brooks and **James R. Kennedy** to the board of directors, Celanese Corp. of America (New York).

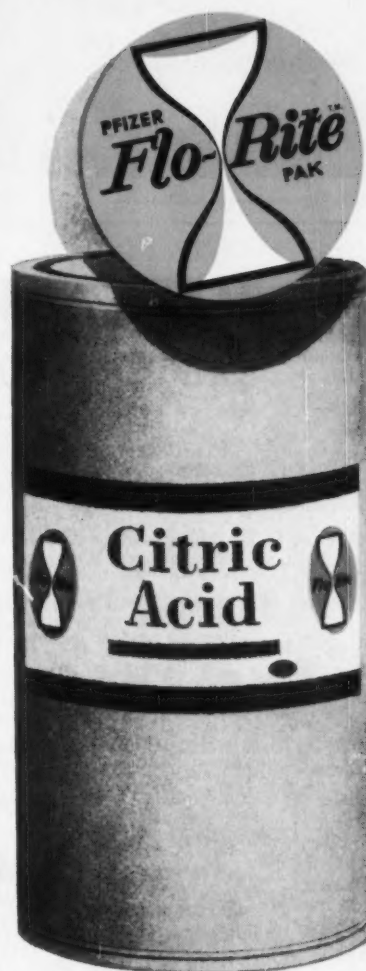
Edward C. Hastings to assistant treasurer, **Charles R. Van Wert** to

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ADMINISTRATION

manager of the treasurer's government contracts division, Hercules Powder Co. (Wilmington).

John A. Wilson to secretary, Diamond Alkali Co. (Cleveland).

Norman C. Riley to the board of directors, National Starch and Chemical Co. (Canada) Ltd.

Harry J. Alverson, Jr., to treasurer-comptroller, **Clyde N. Gillespie** to secretary and assistant treasurer, powdered metals manufacturer Firth Sterling, Inc. (Pittsburgh, Pa.).

C. E. Wilson to vice-president and general manager, Pacific Moulded Products Co. (Los Angeles).

David J. Fitzgibbons to executive vice-president, Sterling Drug Inc. (New York).

E. G. Knoblock and **J. I. Vandewater** to the board of directors, R. W. Greeff & Co., Inc. (New York), chemical and pharmaceutical firm.

Tommy D. Greer to assistant to the president, **W. N. Woodward** to controller, Texize Chemicals, Inc. (Greenville, S.C.).

Grant A. Brown to general counsel and member of the board of directors, Amoco Chemical Co. (Chicago), Standard Oil Co. (Indiana) affiliate.

Alexander Keyes to secretary, **Edward Savage, Jr.**, to general counsel and director of administration, **Robert D. Tegtmeier** to treasurer and controller, United Nuclear Corp. (New York).

George D. Matson to financial vice-president and treasurer, Dixon Chemical & Research, Inc. and Dixon Chemical Industries (Bloomfield, N.J.).

A. C. Treadgold to treasurer, United Carbon Co. (Houston).

John A. Edwards to executive vice-president; **William A. Runge** to comptroller, Liquid Carbonic Division, General Dynamics Corp. (New York).

Roy Blum to general manager, Cryogenics, Inc. (Stafford, Va.).

Coleman F. Hogan to president, the Davidson Rubber Co. (Dover, N.H.).

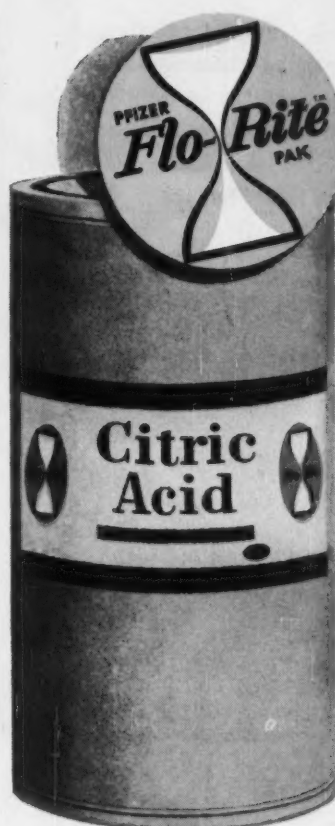
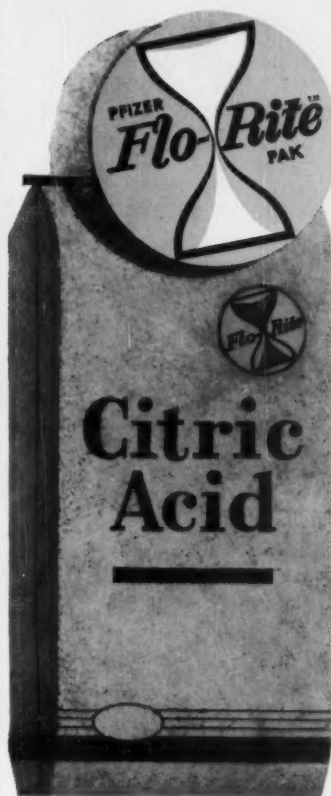
John K. Whittaker to president, Modiglass Fibers, Inc. (Bremen, O.), a subsidiary of Reichhold Chemicals.

THE NEW
PFIZER

**Flo-
Rite**TM

PAK

KEEPS PFIZER CITRIC
ACID FREE-FLOWING,
EASIER TO USE...
AT NO EXTRA COST
TO YOU!



Coming your way in all future shipments—citric acid that stays free-flowing until you are ready to use it!

The Pfizer Flo-Rite Pak embodies a unique combination of advances, in both production and packaging.

To the user this means an anhydrous citric acid that is—and stays—easier to handle and measure.

Extensive tests and studies demonstrate that Flo-Rite Pak works—even when subjected to extremes of temperature and humidity. As an example, Pfizer Anhydrous Citric Acid in the new Flo-Rite Pak was placed in the hold of a vessel sailing from New York to Los Angeles through the Panama Canal. Upon arrival it was stored for

eight months, then returned to New York where the containers were opened. The acid was found to be as free-flowing as it had been the day it was shipped!

And now Pfizer makes its new packaging available to you! Flo-Rite Pak bags have a skidproof exterior surface, designed to help prevent slippage from pallets or stacks and consequent punctures that cause the acid to be exposed. All Flo-Rite Pak bags and drums employ polyethylene, inside, to minimize moisture-penetration. Drums also contain a dessicant—moisture-absorbing silica gel—that provides continuing protection after the drum has been opened, provided proper re-sealing is effected.

Best of all, Flo-Rite Pak citric acid, with its greater-than-ever resistance to caking, is available to you at not one extra cent of cost. It is offered as part of Pfizer's continuing efforts to provide the best possible product to its citric acid customers.

Don't settle for anything less—order Pfizer Flo-Rite Pak Citric Acid. Available from Chas. Pfizer & Co., Inc., Chemical Sales Division, New York 17, New York.

Science for the world's well-being®
Pfizer

CHEMICAL SALES DIVISION

This industrial complex, known as "Rubbertown," is just southwest of Louisville on the Ohio River. Producers of chemicals and allied products located here are:

- ① B. F. Goodrich Chemical Company
- ② Air Reduction Chemical and Carbide, A Division of Air Reduction Company
- ③ E. I. du Pont de Nemours & Company
- ④ Rohm & Haas Company
- ⑤ American Synthetic Rubber Corporation
- ⑥ Stauffer Chemical Company



"Rubbertown"—more proof of KENTUCKY's opportunities for you

Kentucky's tremendous growth in chemicals more than doubled the industry's national rate of expansion during the period 1947-1958. Investments in new and expanding operations exceeded \$200,000,000.

One Louisville area, called "Rubbertown," produces great quantities of synthetic rubber (three types), resins, plastics materials, acids, liquid refrigerants, industrial gases, and many other products.

But "Rubbertown" is only part of Kentucky's explosive growth in the industry. Calvert City, in Western Kentucky, is one of the nation's fastest-growing chemical complexes—ranks as the second largest producer of chemical products in Kentucky.

What are the reasons for this tremendous growth? A combination of advantages. Kentucky is at the center of your markets with 26% of all chemical

process industries located in Kentucky or its seven bordering states. Kentucky has a great concentration of electric power capacity . . . abundant supplies of surface and ground water, natural gas, coal, limestone, fluorspar, clays, and sands.

Combine these factors with the State's favorable labor climate, its record number of financing plans for new and expanding industry . . . and you readily understand why *Kentucky is the Nation's Number One industrial opportunity.*

A complete study of Kentucky's competitive advantages for the chemical industry has just been prepared. May we send you a free copy?

Address: Lt. Governor Wilson W. Wyatt, or
E. B. Kennedy, *Commissioner*

Department of Economic Development
750 State Capitol Building, Frankfort, Kentucky

COMMONWEALTH OF

KENTUCKY

WHERE
BIG THINGS
ARE HAPPENING

CHEMICAL NEWS

from

Allied
Chemical

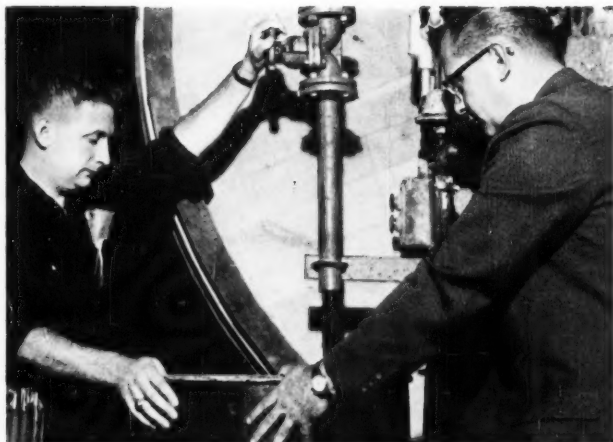
- *how technical service helps*
- *new polyether plant*
- *U-F Concentrate-85 benefits paper*
- *HF production expanded*

TETRAHEDRIL ANVIL HINGE UNIT

• *Solvay Technical Service helps tanner cut costs*
...improve manufacturing process

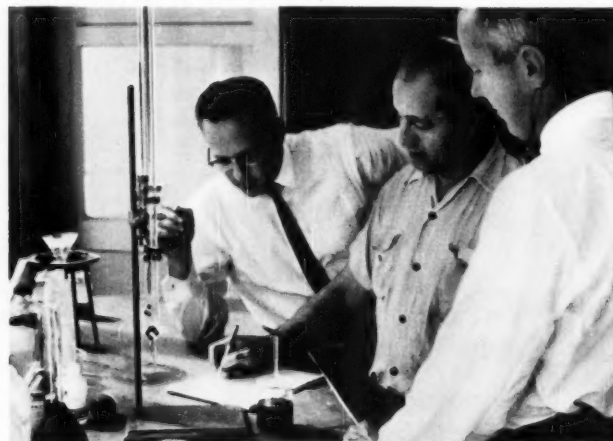


Here the Solvay
Technical Service
representative discusses
production techniques
with an operator who can
produce an equivalent
of 16,000 lbs. of dry
proprietary tan in
five hours.



Tanning liquor being delivered at the point of use by simply turning a valve. System was designed and installation supervised by Solvay Technical Service man at right.

Solvay Technical Service representative talks over quality controls and analytical methods with chief chemist in customer's laboratory.



Problem: Using a dry proprietary chrome tanning compound, the tanner had to mix very small batches as needed.

Solution: When he changed over to making his own chrome tanning liquor, he could mix Mutual sodium bichromate liquor with other materials in large batches, then transfer the solution to a storage tank from which it could be piped into the tannery, as required.

Result: Substantial savings from lower material costs, reduced handling and less labor. In addition, he can now produce his own chrome tanning liquor at a uniform basicity adjusted to his own specific requirements.

Solvay Technical Service experts assisted at every stage—designing the process, planning the installation, training personnel, establishing quality controls. Perhaps Solvay Technical Service can help you with similar problems in this or other fields. Write for further information.

■ **SOLVAY PROCESS DIVISION**

• *Allied Chemical now only supplier
of all basic urethane components
...with ACTOL polyether production*

When its new ACTOL polyether plant goes on stream early this summer, Allied Chemical will become the first and only supplier of both major ingredients of urethane foams—polyethers and diisocyanates. This ability to deliver both principal components, fully compatible with each other and produced to rigid specifications, is expected to result in better foams with many superior properties.

But that's only part of the story. Allied Chemical's expanded urethane research staff is working constantly to perfect new and better polyethers, improve understanding of urethane reactions and formulate superior end products for the industry.

Write today for further information on Allied Chemical products for urethane foam-makers—ACTOL polyethers, NACCONATE® diisocyanates, and GENETRON® blowing agents.

■ NATIONAL ANILINE DIVISION



Rigid urethane foam being sprayed onto a 4000-gallon Allied Chemical tank car in a recent test application. A 4-inch thickness was applied over the tank body with a 1/8-inch thickness of polyester fiberglass as a vapor seal and protective coating. This experimental tank car is expected to yield data which will determine the economies in construction and maintenance through the use of urethane foams.



- *Allied Chemical U. F. Concentrate-85 adds
paper coating improvement to many new uses*

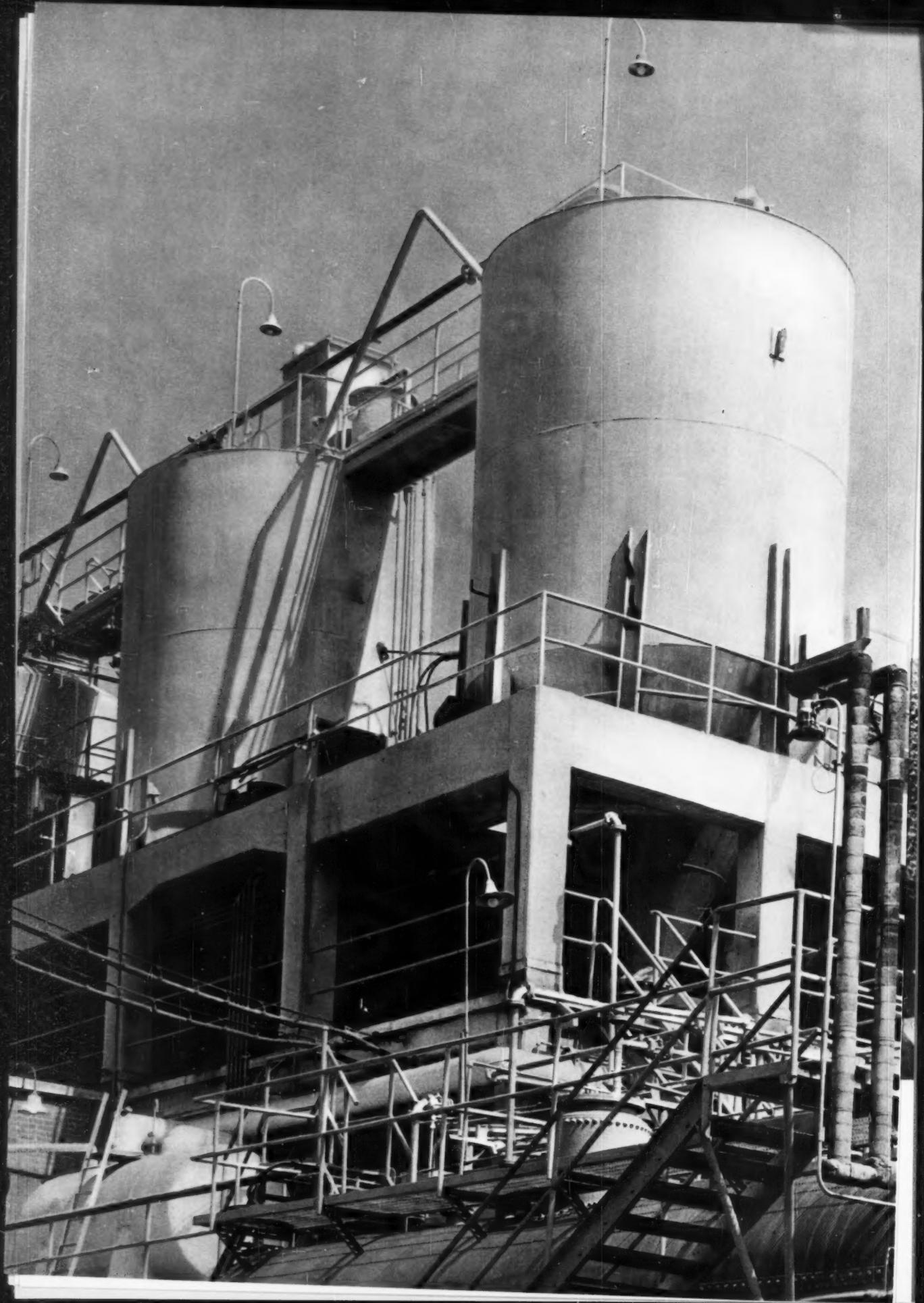
Another important application for Allied Chemical U. F. Concentrate-85 has recently been demonstrated—this time in the paper industry.

Addition of a 25% concentration of U. F. Concentrate-85—a high solids content product of urea and formaldehyde—to starch-clay colors, results in better paper coatings, trial runs indicate.

Not only is the wet-rub resistance of the coated papers increased and printability improved but the new urea-formaldehyde product also has a unique preservative action. The formaldehyde contained in U. F. Concentrate-85 retards starch deterioration, sharply reducing unpleasant batch odors in hot weather.

Write for further information on this versatile product.

■ **NITROGEN DIVISION**



• *top hydrofluoric acid producer*
continues to expand facilities and services

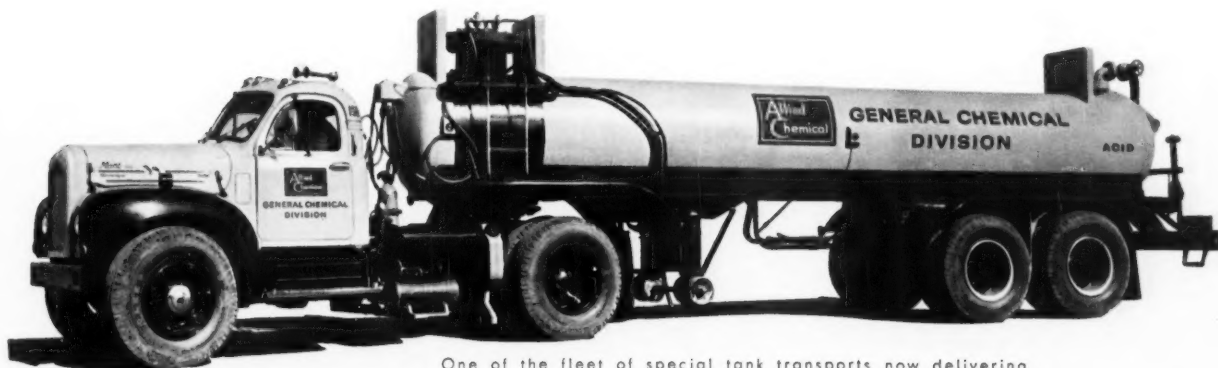
Our General Chemical Division will soon complete construction for a 50% expansion of hydrofluoric acid capacity at its Delaware Works, near Philadelphia.

This and other recent expansions will have increased Allied's hydrofluoric capacity, basis anhydrous acid, over 100% in the past five years.

Thus, the Company has geared itself to meet all atomic energy and industrial needs for the foreseeable future.

Long the nation's primary producer, General Chemical Division makes anhydrous and aqueous hydrofluoric acid at three plants, the other two being at Baton Rouge, Louisiana, and Nitro, West Virginia. It also stocks aqueous HF, 70%, at five bulk stations in major consuming centers.

Recently, too, General Chemical introduced tank transport delivery of aqueous and anhydrous HF on a country-wide basis—using a fleet of special transports each with 15 net ton capacity. This innovation offers a new high in convenience and flexibility of service, and extends the availability of bulk shipments to consumers everywhere.



One of the fleet of special tank transports now delivering hydrofluoric acid to General Chemical Division customers.

For further information on how General Chemical's expanded hydrofluoric acid production facilities and special tank transport delivery service can be put to work for you, just call or write your nearest General Chemical office.

■ **GENERAL CHEMICAL DIVISION**

Delaware Works of Allied Chemical's General Chemical Division, where hydrofluoric acid production is being boosted 50%.

• *principal products for industry:* **BARRETT DIVISION**—prepared roofing; built-up roofing; fiberboard, gypsum and other building products; paving materials, including bituminous liquids, bituminous concrete and aggregates.

GENERAL CHEMICAL DIVISION—sulfuric and other commercial acids, alums, phosphates, fluorine and sodium compounds; **BAKER & ADAMSON** reagents and fine chemicals; **GENETRON** refrigerants and aerosol propellants; agricultural insecticides, fungicides, weed killers and specialties.

INTERNATIONAL DIVISION—selling Allied Chemical products for export markets.

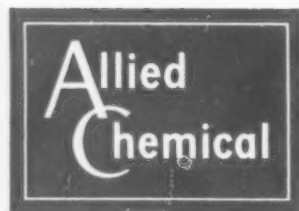
NATIONAL ANILINE DIVISION—**ACTOL** polyethers; **NATIONAL** dyes and certified colors; **HARMON COLORS** (organic pigments); **NACCONOL** detergents, organic chemicals and intermediates, pharmaceutical chemicals; **NACCONATE** diisocyanates for urethane products; **CAPROLAN** nylon fiber.

NITROGEN DIVISION—**ARCADIAN** fertilizers, nitrogen solutions; **PROCADIAN** feed mixtures, ammonia, urea, ethylene oxide, ethylene and polyethylene glycol, ethanolamines.

PLASTICS DIVISION—coal-tar chemicals; **PLASKON** molding compounds, industrial and coating resins; **A-C** polyethylene; industrial tar products, including creosote oils, pitches, coatings, pipeline enamels.

SEMET-SOLVAY DIVISION—Coke and by-products; **WILPUTTE** by-product coke ovens and coal chemicals plants and engineering services.

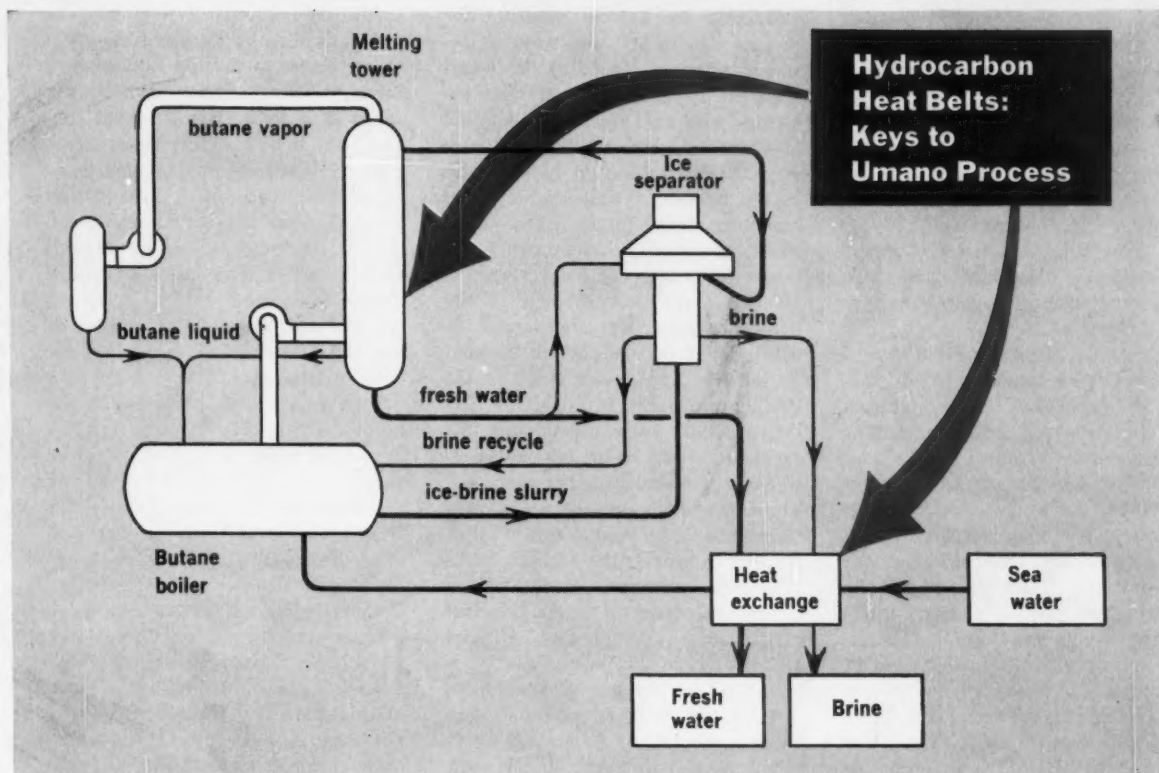
SOLVAY PROCESS DIVISION—soda ash, caustic soda, potassium carbonate, caustic potash, chlorine, chloromethanes and benzenes, hydrogen peroxide; calcium, aluminum, ammonium chlorides; cleaning compounds; vinyl chloride; **MUTUAL** chromates.



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Cooling Down Desalting Costs

Last week in Germany a new profit-conscious contender was entered in the sea-water conversion race: the freezing process developed by Shiji Umano, chief chemical engineer of Chemical Research Institute (Japan).

Claiming the lowest total operating costs of any proved desalting route—35-45¢/1,000 gal., the Umano process compares favorably with operating costs of 38¢-\$1/1,000 gal. for other freezing processes. It offers the latest solution of the desalting problem, which could bring U.S. engineering firms \$100 billion in new construction projects during the next 20 years.

In a paper delivered during the Achema show in Frankfurt (see p. 133), D. F. Othmer, of Brooklyn Polytechnic Institute, described the Umano* process to the European Congress of Chemical Engineers (*CW Technology Newsletter*, June 17).

* The process has been licensed for sale in the U.S. and outside Japan by Clark Division of Dresser Industries (New York).

Othmer, a consultant to the Office of Saline Water (U.S. Dept. of Interior), says the process has been operated for months at a time in a unit that turns out about 52,000 gal./day of fresh water. This is more than triple the capacity of the Carrier-process pilot plant, which has been set up at Wrightsville Beach, N.C. (*CW*, Jan. 14, p. 30).

Like the Carrier process, the Umano process separates fresh water from sea water by freezing out crystals of pure ice through direct refrigeration. But it removes the heat of fusion for ice formation with a secondary refrigerant, boiling butane or isobutane. The Carrier process uses water vapor itself.

There's a big advantage in using secondary refrigeration. Because of the low vapor pressure at the freezing point of concentrated brine (14-18 F), compressors must pull off the water at extremely low vacuum. But a secondary liquid such as butane exerts a vapor pressure (absolute) of

6-10 psi. at the freezing point of brine. A relatively light vacuum is needed here, simplifying the problem of recompressing the vapors for condensation.

Hydrocarbon Heat Belts: In essence, the Umano process is designed around two circuits of recycling hydrocarbons. Both transfer heat. The first, using hydrocarbons in the distillation range of gasoline, absorbs heat from the incoming sea-water feed and then gives it up to the cold fresh-water product and to the waste concentrated brine. Although it is intimately mixed with both the sea water and fresh-water product, the immiscible hydrocarbon is chosen so that it will not carry any salt or impurities from the sea to the fresh water.

The second heat belt is either isobutane or butane. It passes through a change of phase from vapor to liquid. Boiling in contact with the freezing brine solution, it absorbs the heat required to freeze pure ice

crystals. Then its vapors are compressed and, after the fresh water crystals have been separated from the brine, blown up through a descending stream of fresh water-ice slurry, where it gives up its heat of condensation as it melts the ice.

This dual combination of heat belts results in a relatively simple process that is said to offer several advantages:

(1) Permits operation near atmospheric pressure, without the high equipment costs of high vacuum or high pressures.

(2) Avoids high temperatures of the vaporization processes (*see Dimension, below*). Thus cheap construction materials—e.g., concrete, steel or cast iron—may be used.

(3) No metallic surfaces are required because evaporation, freezing, heating and cooling are carried out by direct contact of fluids. This avoids any problem of scaling on metallic surfaces and the difficulties of transferring through low film coefficients.

(4) Uses relatively modest sizes of equipment. A plant for 10 million gal./day of fresh water can be a single unit with several ice separators (centrifuges). The largest turbocompressor would be a single unit of 300,000 cu.ft./minute. The Carrier Corp. has calculated that 120 units of this size would be required for a

direct water-vapor-refrigeration plant of the same capacity.

Tracing the Process Steps: In the process (*see p 93*) sea water is assumed entering at 59 F. It is de-aerated, then passed through heat exchange with cold hydrocarbon liquid in a vertical, cylindrical tank. Water enters at the top and the hydrocarbon at the bottom; a liquid-liquid interface is maintained at about the middle of the tank, with a column of water in the lower half, one of hydrocarbon in the upper. Thus droplets of the lighter hydrocarbon are forced to trickle up through the water as droplets of relatively heavier water trickle down through the hydrocarbon.

Chilled sea water leaving this first exchanger passes to the butane boiler, where it is mixed with butane liquid. The butane boils off; and ice crystals form, giving up their latent heat of freezing to provide the butane's latent heat of vaporization. As the butane vapors are pulled off to the principal compressor (compression ratio, 1.27/1.0), an ice-brine slurry is drawn off to the ice separators.

These are multiple units of centrifuges employing brine and fresh water recycles to assure that no salt will be carried along with the crystals. They separate an ice and fresh-water slurry from a concentrated brine waste, which is passed through hydro-

carbon heat exchange (taking up heat removed from the feed sea water) to the sewers.

Meanwhile, the ice and fresh-water slurry passes to the top of a melting tower, where it flows down over a series of shower trays in direct contact with butane vapors rising under pressure from the main compressor. Since the butane is at 27% higher pressure than in the butane boiler, it will condense as the ice crystals melt. However, heat loss causes some vapors to escape overhead. These are recompressed in an auxiliary compressor and condensed.

In the melting tower, both condensed butane and water fall to the bottom, where they separate into layers. Butane liquid, drawn off from the top layer, is joined to that from the auxiliary condenser. Fresh water from the lower layer is pumped through hydrocarbon heat exchange to the product main.

Centrifuging Crystals: Although Othmer didn't discuss this tricky phase, the Umano process has apparently solved the problem of separating pure ice crystals from the salt brine. According to OSW's saline-water-conversion report for '60 (published May 9, '61, by the Dept. of Interior), separation of ice crystals is the major problem in freezing.

The difficulty arises from the small

DIMENSION

The Hard Facts Behind the Production of Soft Water from the Sea

Othmer's talk at Achema gave figures to show the drive behind water desalting processes in the U.S. It spelled out:

Demand: In the U.S., surface flow supplies almost 3,000 gal./day/person of soft water; but growing population is cutting into this, and increasing usage has already pushed consumption to about 1,800 gal./day/person. Supply and demand will balance in about 15 years, with industry and irrigation each taking 45% of output and the remainder going to domestic use. It takes 20 tons of water to make a ton of sulfuric acid or petroleum, 275 tons to make a ton of steel, and many hundreds of tons to grow a ton of wheat. Currently, water sells for less than 1¢/1,000 gal. for irrigation, 2-5¢/1,000 gal. for industry, and 20-60¢/1,000 gal. for domestic use. The U.S. is expected to spend \$100 billion to desalt water in the next 20 years.

Supply: Since '52, the cost of producing fresh water from sea water has been reduced from about \$5 to about \$1 (current) per 1,000 gal., and 40-50¢/1,000 gal. is probable for the next generation of plants. At the same time, it costs 5-15¢/1,000 gal. for each 100 miles to trans-

port water in large aqueducts. (At the Feather River Project in California cost of transporting water 750 miles south is \$3 billion—about 50¢/1,000 gal.) To make sea water potable, the salt concentration must be reduced from about 3.5% (35,000 parts per million) to 500 ppm.

Current evaporation processes with economic potential for recovering potable water from the sea:

Multiple-effect evaporation. Approaching its highest state of development, this system can operate at about \$1/-1,000 gal.; investment costs: \$1,250/1,000 gal./day.

Vapor-compression evaporation. Using a compressor to pump flashed water vapors up to a pressure at which they will condense when heat exchanged with a forced circulation of sea water, this process has been used extensively to concentrate wood pulp digester liquors, etc.; it can produce potable water from the sea at about 50¢/1,000 gal. in a 1-million-gal./day plant with investment of about \$1,250/1,000 gal./day.

Multiple-flash exaporation. Flashing water vapors through 50 or more expansions, this process produces water at \$1/1,000 gal.; investment: \$1,600/1,000 gal./day.



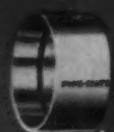
Diamond-hard ½" alumina cylinders, vibrating at high frequency, wet-grind particles to .000039-inch in a SWECO Vibro-Energy Mill.

Chronic problem for many process industries: uniform grinding or dispersing to a size of one micron or smaller on a production basis. SWECO solution: efficient conversion of energy to particle size reduction through high-frequency, three-dimensional vibration. Result: production of ultra-fine particles of narrow size range, faster, more economically, with little or no contamination.

For higher product quality and profit potential, write for illustrated technical paper on the new Vibro-Energy Mill.



SOUTHWESTERN ENGINEERING COMPANY, Dept. 330, 4800 Santa Fe Ave., Los Angeles 58



Aligning Connectors



Backup Flanges



180° Returns



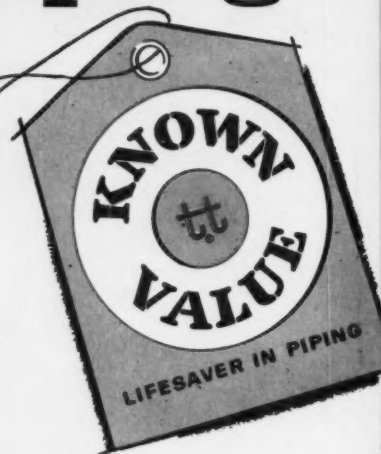
"Plug-R-Cops"



Tees

CUT process piping COSTS with PIPE-MATE®...

**Industry's most versatile line of lightweight
stainless steel pipe fittings and flanges**



With the ever increasing use of low cost, lightweight stainless steel pipe in modern corrosion resistant process piping systems, has come the most logical preference for PIPE-MATE fittings and flanges. First, PIPE-MATE fittings provide a new versatility in piping fabrication that lets you choose the pipe-to-pipe and pipe-to-fitting joining method best suited to your job. Second, PIPE-MATE lightweight stainless steel fittings are available in every needed form and size from $\frac{1}{2}$ " to 4", in Schedules 5S and 10S.

PIPE-MATE fittings can be butt welded with either metallic arc or shielded inert gas welding techniques. Or, employing the PIPE-MATE aligning connector they can be fillet welded, brazed or silver soldered for permanent, leak-proof joints. PIPE-MATE aligning connectors eliminate costly misalignment errors, too. The entire piping system can be "pre-fitted" and ad-

justed for misalignment before a single joint is made up.

PIPE-MATE rolled-in flanged connections provide the perfect means for installing process piping systems when welding equipment is unavailable, when hazardous conditions dictate flameless fabrication, or when rapid system assembly and dis-assembly are required. PIPE-MATE rolled-in flanged joints are remarkably easy to make... no special skills or costly tools are needed. Extra long tangents on all PIPE-MATE fittings assure adequate flange clearance, and the rotatable flange makes bolt hole alignment easy.

Get all the facts today, and see how lightweight stainless steel piping and PIPE-MATE fittings can cut your process piping system costs. Write for Bulletin TT944-F-143. TUBE TURNS, Louisville 1, Kentucky.

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T.M. Reg. U.S. Pat. Off.

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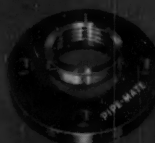
Stub Ends



Concentric Reducers



Crosses



Insert Flanges



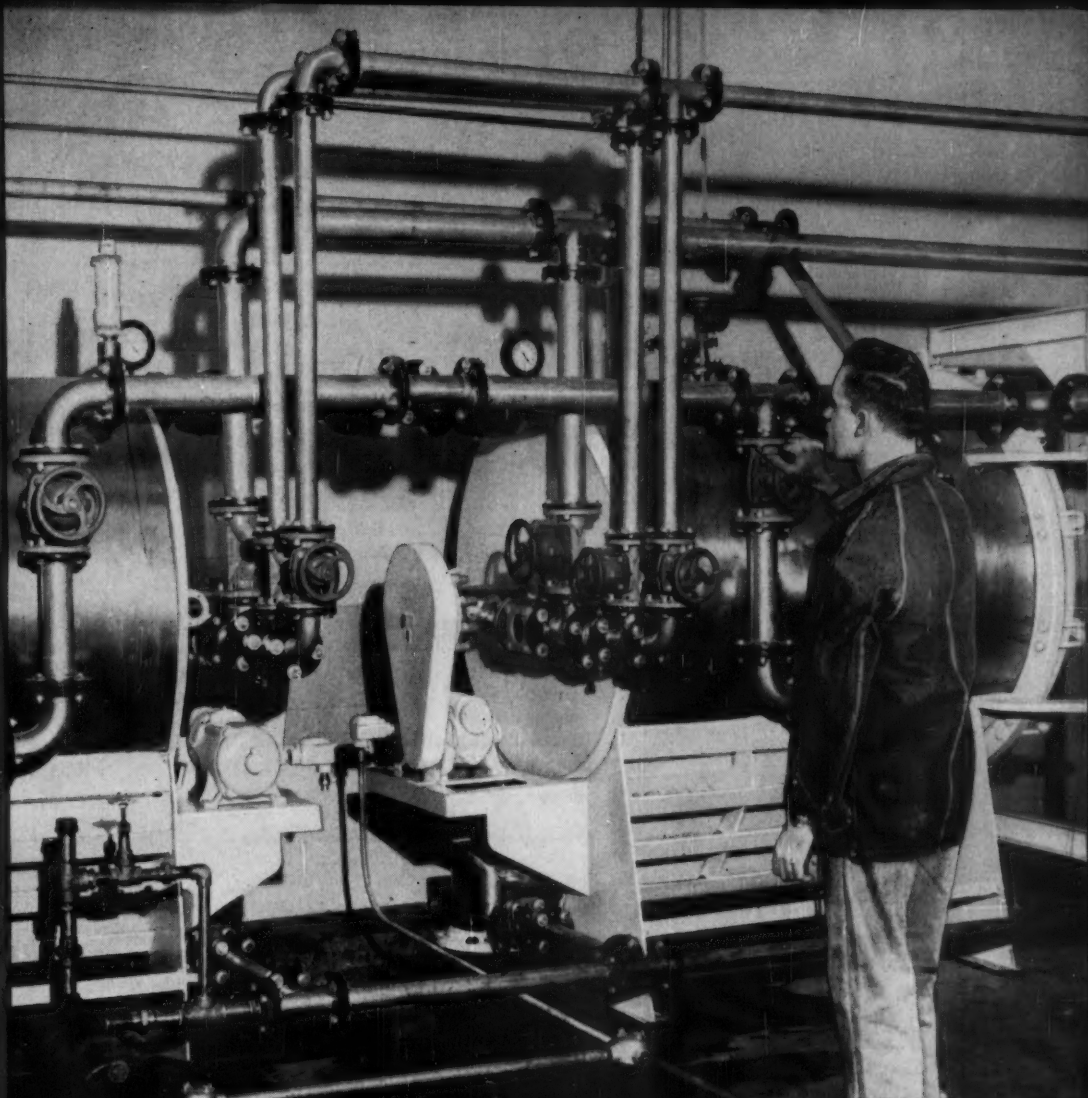
90° Elbows



Eccentric Reducers



45° Elbows



Lightweight stainless steel process piping systems fabricated with PIPE-MATE rolled-in flanged connections cost less to install and save up to 50% in pipe costs, too.



for butt welding . . .



for fillet welding . . .



for rolled-in flanges

PIPE-MATE fittings are stocked by and sold exclusively through authorized Tube Turns Distributors



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We like to work with hardboiled plant location people. The harder-boiled the better. That's because we can prove the Toledo-Northwestern Ohio area offers unmatched opportunities for Chemical Process Industries. Our proof is contained in a survey of the area by Fantus Research, Inc., one of the nation's foremost industrial location services. For more information, write or call R. E. Johnson, Manager, Industrial Development Department, The Toledo Edison Company, Toledo 1, Ohio

THE TOLEDO EDISON COMPANY
an investor-owned electric light and
power company serving Northwestern Ohio

ENGINEERING

Desalting Demonstration Plant Program: 1960

Process Selection	Plant Size	Site Selection	Construction Contract	Remarks
Long-tube, vertical, multiple-effect distillation	1 million gal./day	Freeport, Tex.	June 8, '60 Chicago Bridge & Iron Co. \$1.3 million	Scheduled for operation April '61; sea water
Multistage flash distillation	1 million gal./day	Point Loma, San Diego, Calif.	Nov. 5, '60 Westinghouse Electric Corp. \$1.6 million	Scheduled for operation Dec. '61; sea water
Electrodialysis	250,000 gal./day	Webster, S.D.	Nov. 6, '60 Asahi Chemical Industries Co. \$482,000	Scheduled to be in operation Oct. '61; 1,800 ppm., brackish water
Forced circulation vapor compression	1 million gal./day	Rosewell, N.M.	—	Brackish water
Freezing	150,000-350,000 gal./day	East Coast	—	Sea water

size of the ice particles. They offer a large surface area on which the salty brine may be held within the interstices of the crystals. The report says, however, that centrifuging and countercurrent washing are recent techniques that have been successful in handling the problem.

As shown on the flowsheet, the Umano process uses both an apparent countercurrent wash (from the freshwater recycle to the recycled brine) as well as centrifuging. And the process's long successful operation indicates that the ice-brine separation problem has been solved.

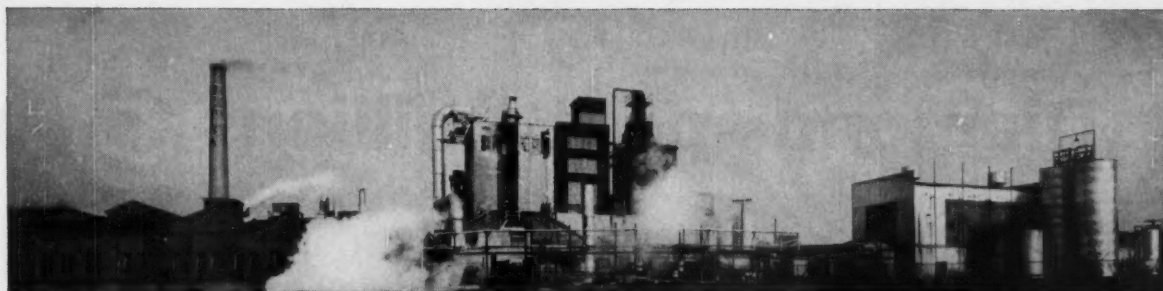
Hopeful Hydrates: The Umano process, along with other freezing processes, appears to bring to a close the second phase of the battle of economics in converting sea water. The first phase saw distillation and systems such as vapor compression bring the cost down from about \$5/-1,000 gal. to about \$1/1,000 gal. These routes have just about reached the ultimate in design efficiency, however, with little hope for further improvement in economics.

While the freezing processes are a long step forward, they are still far above the 2-5¢/1,000 gal. range currently paid for industrial soft water. And still newer routes are being ferreted out by the Research Division of OSW.

Other firms—e.g., Koppers Co.—are studying the possibility of a hydrate process (*CW*, Dec. 10, '60, p. 108). This route, which follows the same principle as freezing (separation by change of phase from liquid to solid), seeks to improve the costs of freezing processes by uncovering compounds that form hydrates. Since these hydrates can have a lower heat of formation, such a method may prove less expensive than current processes.

At Syracuse University, 30 hydrate-forming compounds have been examined, with the most promising being methyl bromide or special Freon-type compounds. Yet much work remains to be done to establish the amount of water that can be held in a given hydrate and to study the effects of temperature and pressure on gaseous, liquid water and hydrate compositions.

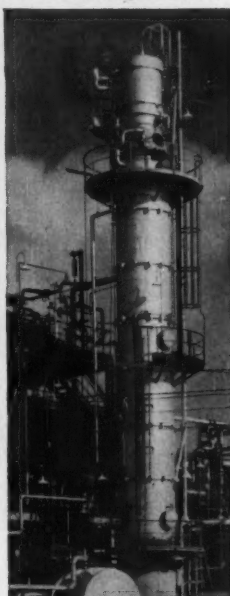
If some of these compounds turn up with the correct properties, it's likely that much of the experience gained with the freezing processes will be applicable to the design of economical hydrate process plants. In such an event one question will remain: Which firm will build them? With a \$100-billion prize at stake, it's certain that engineers will keep scrambling to come up with the answer.



A wide range of surface active agents and basic detergent chemicals for household and industrial uses is manufactured by Ultra Chemical Works, Inc., in Paterson, N.J. Other Ultra plants are located at Chicago, Ill., Hawthorne and Los Angeles, Calif.



High-grade white oils, petrolatums, petroleum sulfonates and microcrystalline waxes are manufactured in the Petrolia, Pa., refinery of Witco's subsidiary, Sonneborn Chemical and Refining Corporation. Other Sonneborn plants and facilities are located at Franklin, Pa., and Belleville, N. J.



Phthalic Anhydride of unsurpassed purity and uniformity for the paint, plastics, dye and other major industries is manufactured at this new Witco facility in Chicago.

THE WITCO GROUP

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In these and the many other plants and laboratories of the Witco group strategically located around the country, a highly diversified line of quality chemicals is developed and manufactured to help industry meet growing demands for products that will perform easily, efficiently and economically. The Witco group is currently expanding its research, manufacturing and marketing facilities both here and abroad to provide more useful products, faster shipments and increased technical service.



Sonneborn Chemical and Refining Corporation—petroleum sulfonates, white oils, petrolatums, microcrystalline waxes, lubricating oils and greases, solvents and other petroleum specialties. Textile chemicals and building-products specialties.



Ultra Chemical Works, Inc.—Alkyl aryl sulfonates, amine condensates, xylene and toluene sulfonates and other basic surface active agents.



Organic Chemicals Division—metallic stearates, paint driers, urethane resins, phthalic anhydride, emulsifiers for agriculture, food and chemicals specialties.



Rubber Chemicals Division—carbon blacks, and anti-sunchecking waxes.



Pioneer Products Division—asphalts, mastics, adhesives, and sealers.



Tar Products Division—naphthalene, creosote oil, tar acids, tars and pitches.



Witco Chemical Company, Ltd.—synthetic and natural rubber latices, dispersions, adhesives and auxiliary chemicals.

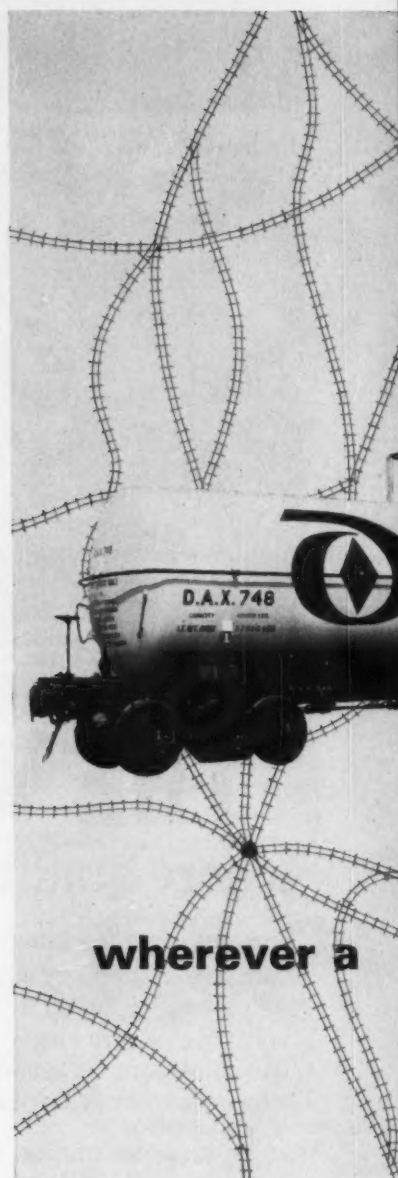
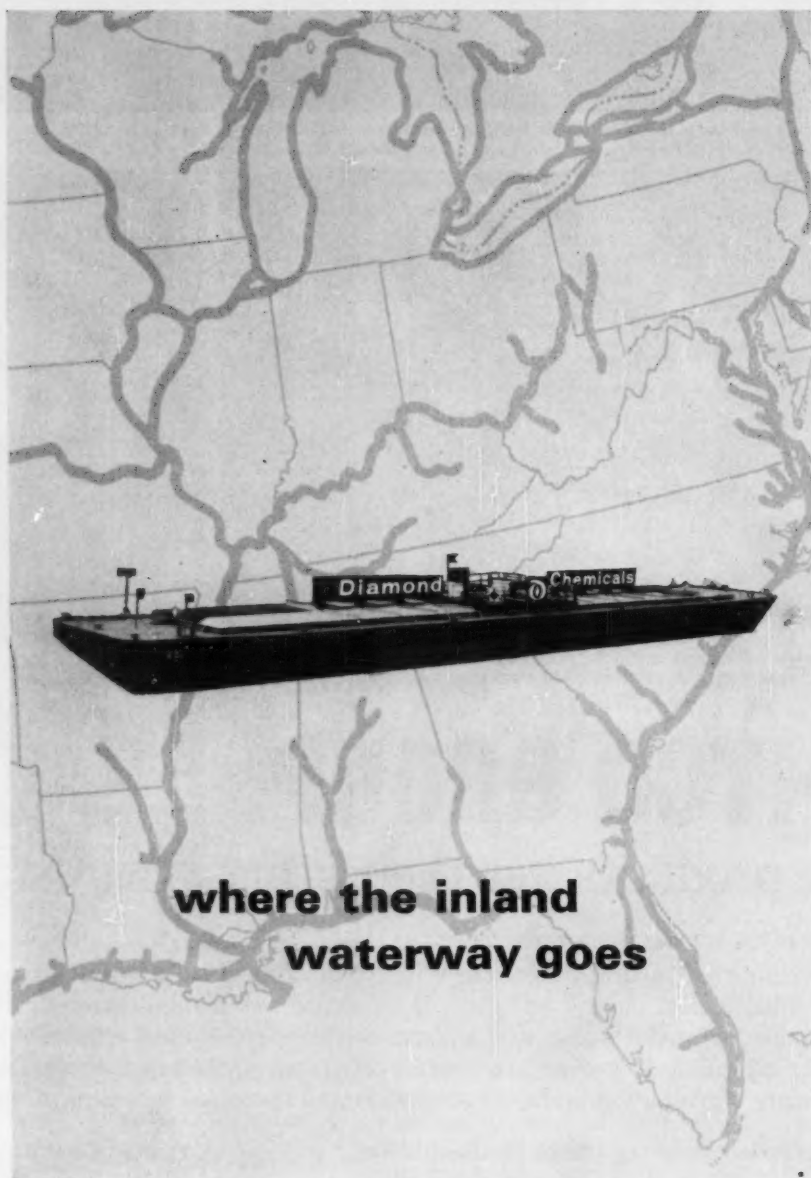


Soden Chemicals Division of Witco Chemical Company, Canada, Ltd.—metallic stearates and industrial chemicals.



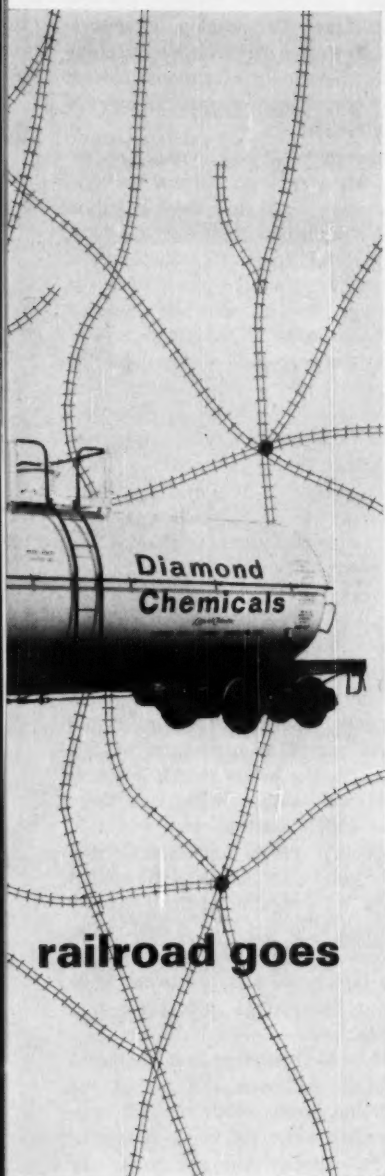
WITCO CHEMICAL COMPANY, INC.
122 East 42nd Street, New York 17, N. Y.

Diamond spent \$millions to cut

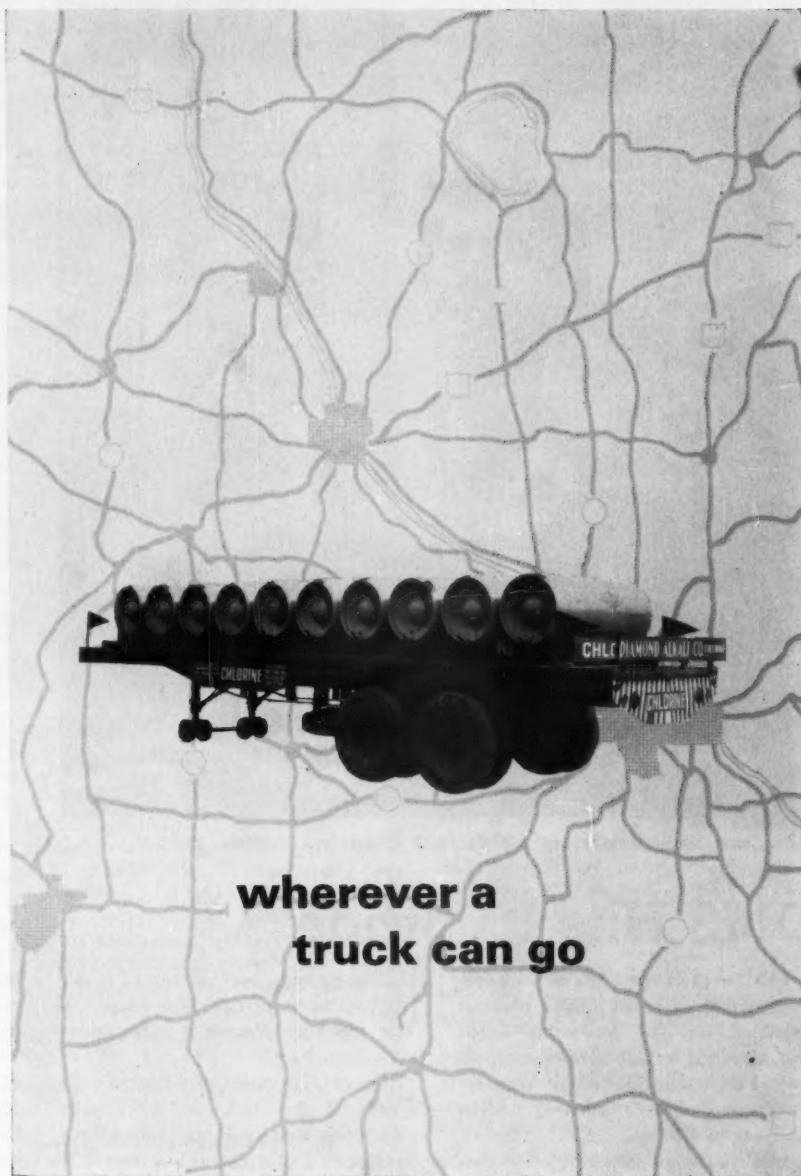


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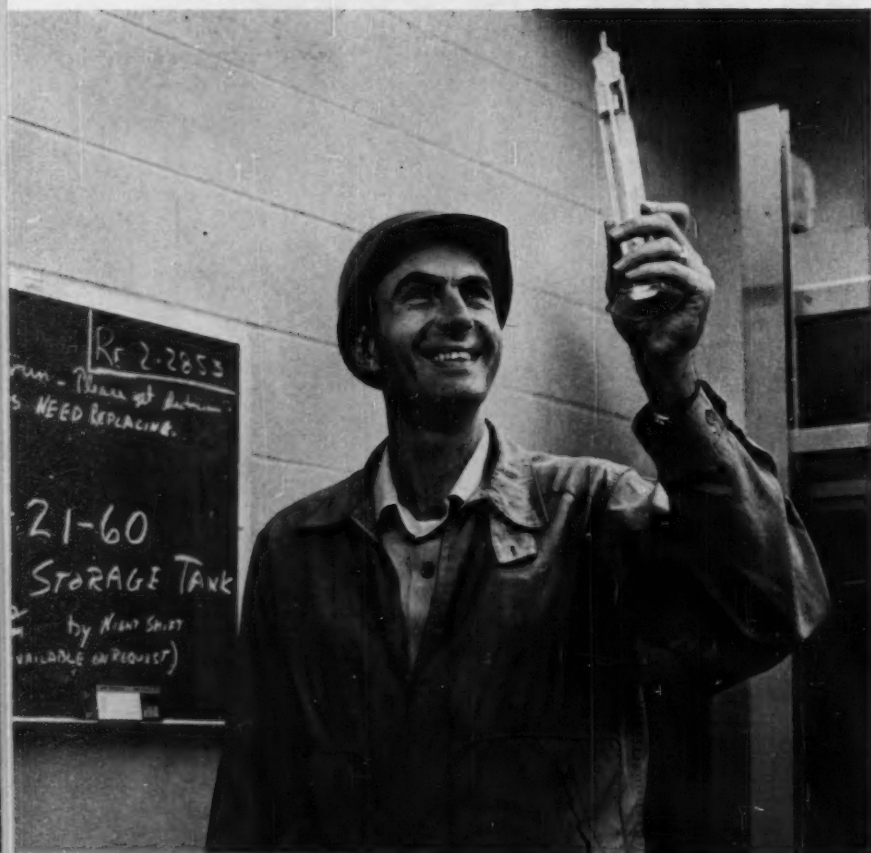
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 **Diamond Chemicals**



CZ plant superintendent holds first dimethyl sulfide output.

DMS Hits Its Stride

This week Crown Zellerbach reports that its new, \$2-million plant at Bogalusa, La. for converting lignin into dimethyl sulfide (DMS) and dimethyl sulfoxide (DMSO) is now operating at design capacity—5 million lbs./year of DMSO.

This marks an important step forward by CZ in converting lignin, which represents one-half the content of every tree, from an almost useless byproduct into a chemical having commercial value. (At present some 7 million tons of alkaline lignin are available each year in the U.S., little of which is being utilized commercially.)

The new plant is only part of CZ's effort to utilize lignin. Sulfite lignin (about 500,000 tons are available in the U.S. each year) can be converted into phenolic compounds via another

process recently licensed from Japan's Noguchi Institute (*CW*, May 13, p. 77). The Japanese process is now under evaluation by CZ.

The only producer of dimethyl sulfoxide in the U.S. today, Crown Zellerbach developed its process as a modification of a Swedish system. CZ has exclusive Canadian and U.S. rights to a process (U.S. patent 2,702,824) developed by Nitroglycerin Aktiebolaget (Gyttorp).

Dimethyl sulfide has some commercial use of its own—e.g., odorant for natural and liquefied gas—but most of it is intended as an intermediate material for DMSO. So far, the principal use of DMSO has been in spinning polyacrylonitrile fibers. Toyo Rayon Co. (Osaka, Japan) precipitates its new polyacrylonitrile fiber from the sulfoxide.

But DMSO is also being used as a solvent and reaction medium for new insecticides. To develop large-scale market, Crown Zellerbach is banking on the reportedly exceptional solvent and dispersing characteristics of the chemical.

Other possible commercial applications: as a spinning solvent for synthetic fibers other than those based on polyacrylonitrile; for dyeing synthetic and natural fibers; to transport and selectively separate gases such as acetylene; and to separate saturated and unsaturated hydrocarbons.

The Process: Raw material for the Bogalusa DMSO plant is supplied from the waste cooking liquor of CZ's nearby kraft pulping process. First step in making DMSO is to make DMS. Lignin methyl groups in the cooking liquor waste, or black liquor, react with sulfur to form dimethyl sulfide. The plant has capacity for 10 million lbs./year of DMS (*CW Technology Newsletter*, Dec. 24, '60).

Black liquor goes directly from the kraft process to a heater using a specially designed high-pressure pump. This pump handles 172 gpm. at 200 F and pumps at a pressure of 500 psi. From the heater, black liquor is mixed with molten sulfur and flows into a 450 F reactor.

Dimethyl sulfide and methyl mercaptan can be formed from the methyl groups in the lignin and these pass off overhead as a gas into a flash tank. Bottoms from the tank, dimethylated black liquor, are returned to the kraft mill to be used as a fuel for that operation.

The methyl mercaptan is recovered overhead. Although CZ is not yet producing it, the mercaptan will be a by-product, once the major operation is at full capacity. Annual capacity will be over 500,000 lbs.

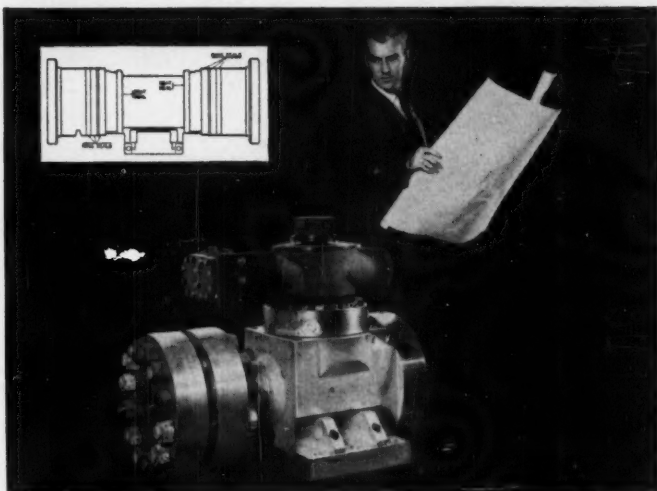
DMSO: Liquid DMS required for DMSO production flows continuously into a liquid-phase oxidation unit. Details of this key unit are proprietary but CZ says it's a modification of the Swedish process and also "differs considerably" from another, German process.

The German process, used by Union Rheinische Braunkohlen Kraftstoff AG. (Cologne, Germany), oxidizes DMS with nitrogen dioxide at 77-113 F and at atmospheric pres-



THE RAW MATERIALS OF PROGRESS

No part too large or complex for corrosion protection with **KEL-F® Dispersion coating** BRAND



The five-ton valve above is used to test a rocket engine fuel line. Its flow valve meters a highly corrosive mix—liquid oxygen and kerosene fuels—at temperatures below -300°F . and pressures up to 5,000 lbs. psi. Yet valve leakage in this precision assembly is zero. And the designer credits corrosion-blocking KEL-F Brand Dispersion coating on valve seat rings and seals, at eight critical points (see diagram above).

Parts and surfaces too large

or intricate to fabricate from a molded plastic can have the benefits of halofluorocarbon protection with KEL-F Dispersion. First you spread, spray or dip coat it. Then with heat application KEL-F coating fuses into a tough, adherent, continuous coating with extreme resistance to corrosive chemical attack at a wide temperature range. (See "profile," right). For further information and design data, fill out coupon below . . .

3M Chemical Division, Dept. KAK-61
3M Company
St. Paul 6, Minn.

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PROPERTIES PROFILE

ON

KEL-F Dispersion coatings BRAND

KEL-F Dispersions were developed to extend the protection of KEL-F Plastic to the surfaces of parts that do not lend themselves to fabrication from molded plastics because of size, design or construction. Consisting of fine particles of KEL-F Plastic suspended in a volatile organic liquid, KEL-F Dispersions can be applied to many metallic and certain non-metallic surfaces by spray, spread or dip coating. Heat fuses the dispersion into a tough, permanent protective coating with high tensile and compressive strength, good elongation, and excellent abrasion and wear resistance.

TYPES OF DISPERSIONS	Type KF-625	Type KF-602
Application Method	Spray	Spread, flow, dip
Pounds solids per gallon	3.6	3.4
Approximate square foot coverage per gallon (per mil thickness)	295	330
Viscosity, Zahn G-1 Cup, 75°F . secs.	34	—
Viscosity, Brookfield, 75°F . cps.	—	9-10,000
Thinners	Xylene	Amyl Acetate

PROPERTIES

Chemical resistance. KEL-F Dispersion coatings resist attack by strong acids, alkalis, gases and oxidants and extremely high temperatures. This makes them outstanding corrosion protectors for aerospace equipment.

Anti-stick characteristics. Glues, inks, paints, greases, waxes, rubber or casting resins will not readily adhere to coatings of KEL-F Dispersions. Coating surfaces of aerospace equipment with KEL-F Dispersions reduces clean-out and shut-down time.

Temperature resistance. Temperature-resistant KEL-F Dispersion coatings have an operational range of 710°F . (-320°F . to $+390^{\circ}\text{F}$.).

Dielectric strength. KEL-F Dispersion coatings have high dielectric strength at low to very high operational frequencies and temperatures. Non-wetting surfaces permit no moisture absorption, minimize flashover.

For full information on KEL-F Halofluorocarbon Dispersion coating systems, send for our brochure on the subject, or write, describing your area of interest to 3M, Chemical Division, Department KAK-61, St. Paul 6, Minnesota.

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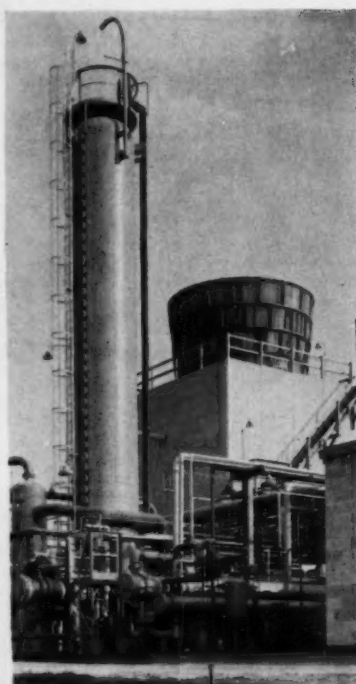
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ENGINEERING



Dimethyl sulfide unit is a key component in making dimethyl sulfoxide.

sure. CZ uses nitrogen tetroxide as oxidizer to convert the sulfide into the sulfoxide. The nitrogen tetroxide is regenerated continuously with oxygen to keep it in the tetroxide form.

Product from the reactor is neutralized with dilute caustic, purified by vacuum evaporation and dehydrated by vacuum fractionation.

Fluor Corp. (Los Angeles), which performed the detailed engineering for the plant, made a complete scale model of the installation before construction to aid in piping and layout. Most variables are controlled through miniature recorders. And a Panalarm system detects major deviations in the process.

Outlook: Crown Zellerbach is offering DMSO at 33¢/lb. f.o.b. Bogalusa in tank cars, 55-gal. drums or in smaller containers. On the same basis, DMS is being sold at 15¢/lb. It sells DMS made at its 1.5-million-lbs./year Camas, Wash., installation, and has been doing so for a long period of time.

The future of these chemicals depends on the opening of new and large markets for them. By building its new plant, CZ is displaying confidence that it can develop such markets.

PROCESSES

Superphosphate Ammoniation: A fluid-bed technique for ammoniation of superphosphate has been worked out by Czech inventors J. Trojan, V. Jara and V. Vanecek. Claimed advantage of the process: it avoids undesirable characteristics such as stickiness, flocculation and high acidity in superphosphate. The superphosphate is fluidized by a current of ammonia gas and air. Ammonia absorption rate in the fluid layer is claimed to be far higher than in conventional units, and the reactor costs (initial and operating) are said to be lower.

Aluminizing Ferrous Metals: The National Metallurgical Laboratory (Bihar, India) has developed three new processes for hot-dip aluminizing of ferrous metals:

(1) A molten flux process that involves a composite flux—chlorides of zinc, sodium, potassium and barium, plus aluminum fluoride and cryolite. This mixture is fluid at 600 C and gives adequate fluxing action.

(2) A process using a hot concentrated aqueous solution of potassium chloride as a flux. Steel pieces are dipped in the solution, then dried. The thin film of salt left on the steel acts as a flux for hot-dipping the aluminum.

(3) A process using linseed oil as the fluxing agent for the pretreatment of steel. This oil film, because of its unsaturation and consequent oxygen absorption, has good fluxing properties.

Electrochemical Machining: A process that permits stress-free machining of complex contours in any metal, initially developed by General Electric, is now being readied for commercial application by Hanson-Van Winkle-Munning Co. (Matawan, N.J.). The firm claims that the process will find use particularly in machining new alloys. It reportedly achieves close tolerances with low-cost operation and low capital investment. The electrochemical machining process is basically the reverse of electroplating. The work piece and a cutting tool (shaped like the desired part) serve as electrodes. A high-amperage current is passed via an electrolyte from the piece to the tool. With the passing of time, stock becomes finished product.



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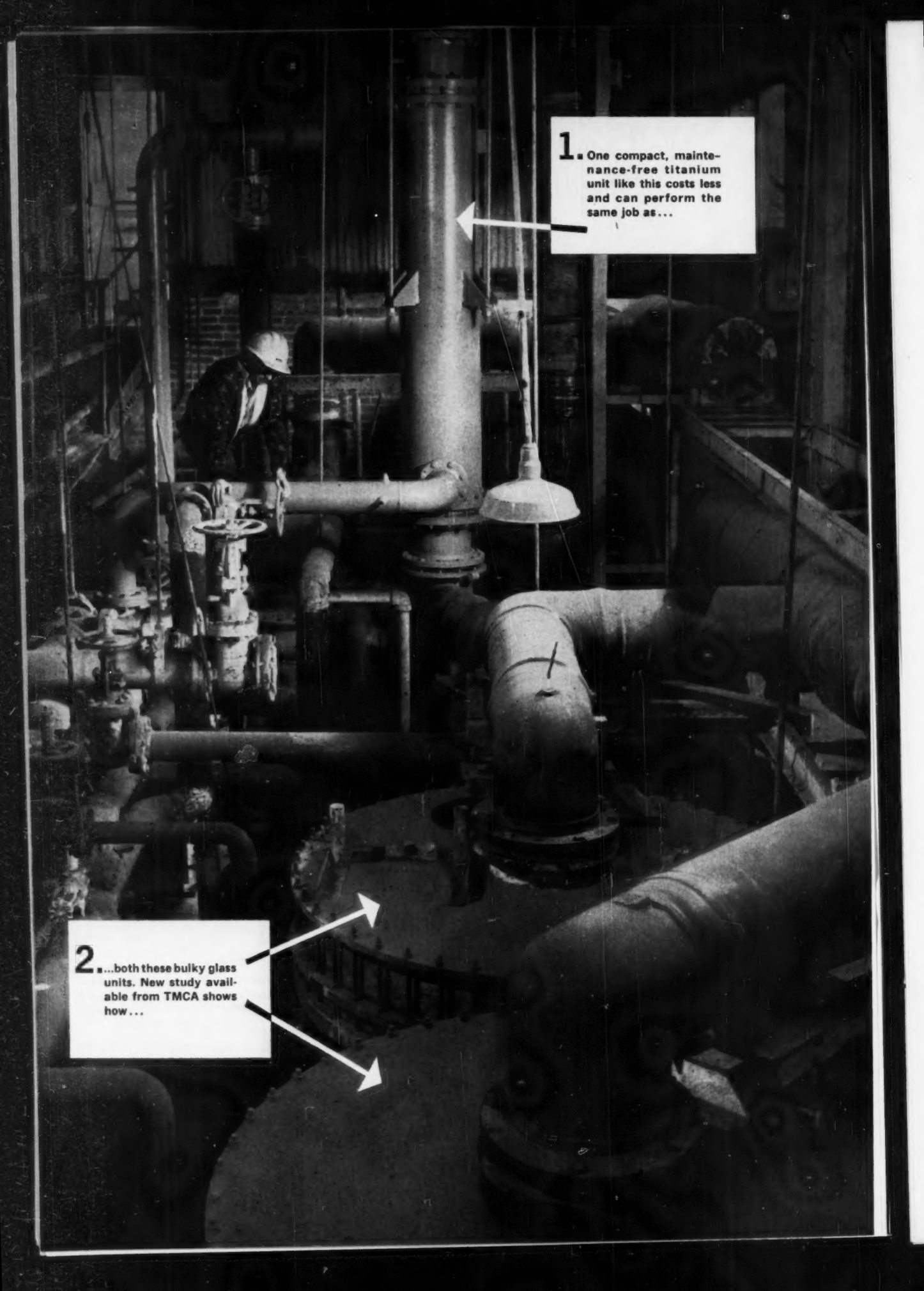
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A black and white photograph of an industrial facility. In the center, a worker wearing a hard hat and a dark jacket is positioned next to a large, vertical industrial unit. The unit is connected to a network of pipes and valves. A large, horizontal pipe with a cross-shaped mark on it runs across the foreground. The background shows more industrial structures and a brick wall. Two white text boxes with arrows pointing to specific parts of the machinery are overlaid on the image.

1 ■ One compact, maintenance-free titanium unit like this costs less and can perform the same job as...

2 ■ ...both these bulky glass units. New study available from TMCA shows how...

In wet chlorine...

Lifetime **Titanium** heat exchangers return 30% on investment, pay for themselves in 2.5 years

According to a new economic study now available through Titanium Metals Corporation of America, titanium heat exchangers for cooling chlorine cell gas can return 30% after taxes on their investment, and pay for themselves in two years and a half, when depreciation is considered.

At the same time they reduce maintenance, increase operating efficiency, save space or allow the use of what is normally wasted space, and eliminate possible product contamination through tube failure.

In existing plants already using contact coolers, the substitution of titanium heat exchangers for steam stripping returns comparable amounts...23% and more on the added investment and a pay-back in three years or less.

These startling returns are gained primarily through reduced operating costs. As the study reveals, a plant producing an average 100 tons a day can save more than \$20,000 a year through the use of titanium coolers.

Glass tube coolers, on the other hand, fare less well. In comparison with titanium used in indirect cooling, their initial cost is higher; the return on investment is lower (8.8%); the pay-out time much longer (5.3 years).

WHY TITANIUM?

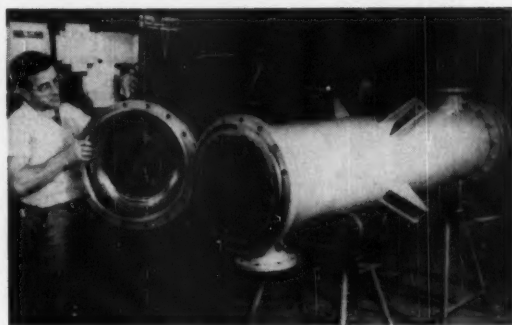
High performance. Among the reasons for titanium's success in this important application are its absolute immunity to wet chlorine corrosion...its lightness and strength, even at high temperatures...its ease of fabrication...and its heat transfer properties, which are significantly better than glass.

Titanium unit costs lowering. TMCA composite price index has dropped from \$15.25 in 1954 to \$6.97 per pound by early 1961. As fabricators have come to realize that titanium is as easy to fabricate as most steel alloys, these costs have dropped too.

The present study is based on the current price of titanium heat exchangers, which now range from \$25 to \$30 per square foot, a considerable reduction over the recent past.

Stauffer unit saves space, more efficient. Stauffer Chemical Company, Niagara Falls, N. Y., has a titanium heat exchanger in chlorine cell gas cooling. The titanium unit requires far less space than either of two glass units and yet can carry the same load as the glass units combined. The titanium heat exchanger is installed in relatively inaccessible, formerly "waste" space, since the unit requires no maintenance. Glass coolers require three to four downtimes a year. Stauffer also reports that the titanium cooler operates at greater efficiency and reduces the amount of sulfuric acid needed in final cooling.

How TMCA can help you cut chlorine cell costs. First, write for the study, "New Economies in Cooling Chlorine." If titanium units appear to be able to help you in your battle against cost—and it is highly likely that they can—talk to Titanium Metals Corporation of America. TMCA's Technical Service Department can put you in touch with competent fabricators and supply the technical data needed to help you trim your costs and boost your process efficiency in wet chlorine...inhibited sulfuric acid...hypochlorites...acetic acid...nitric acid...and other corrosive applications. Write today!



Heat exchanger containing 268 titanium tubes, is used in Stauffer Chemical Company's Niagara Falls, N. Y., plant to cool chlorine gas from 75°C to 40°C. The titanium unit, providing 394 square feet of heat exchange surface area went into operation in 1959, shows no sign of corrosion and needs no maintenance.

**This important study is available
to you at no cost.
"NEW ECONOMIES IN
COOLING CHLORINE."**



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FOB Baton Rouge, La. in phenolic-lined, insulated 8,000 and 10,000-gallon tank cars, or in lined 55-gallon open-head steel drums. Drum stocks will be warehoused at other strategic shipping points in accordance with demand.

For more information and your copy of our Latex manual, write to Enjay at 15 West 51st Street, New York 19, New York.

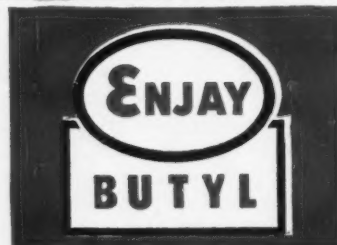
TYPICAL INSPECTION DATA

Total Solids, wt %	55
Specific Gravity, 70°F	0.96
pH	5.0
Viscosity, cps	560
Mechanical Stability	Excellent
Freeze-Thaw Stability	Excellent
Chemical Stability	Excellent

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ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY



Technology

Newsletter

CHEMICAL WEEK

June 24, 1961

Whose computer for Monsanto's mammoth Chocolate Bayou complex? The belief in the trade is that Monsanto has decided on Minneapolis-Honeywell and will disclose soon that three or four of the firm's 290 models will be employed to automate the \$75-million Texas complex.

A new process for making ammonium metatungstate has been developed by the Chemical and Metallurgical Division (Towanda, Pa.) of Sylvania Electric Products Inc. Advantages claimed: it turns out an alkali-free, water-soluble product. As Sylvania sees it, the ability to dissolve the tungstate in water (instead of caustic, which must be used as solvent for other tungsten chemicals) should make it cheaper to use. Its availability as a powder makes for easier shipping and handling. The company envisions its use as a catalyst (in reforming operations, for example) for electroplating and for such reactions as oxidation, hydroxylation, hydrogenation and polymerization.

Future exports of natural gas processing equipment to Canada from the U. S. may hinge on a hassle developing between a group of Canadian metal-working companies and the Tariff Board. The companies have hired W. W. Buchanan (former vice-chairman of the board) who contends that equipment for processing natural gas is covered by Item 446A (refinery equipment in general) and comes under a 22½ % tariff rate. For 27 years, the board has treated such equipment under Item 410B ("recovery of products from coal tar or gas"), which qualifies for a special 10% rate.

Buchanan points out that the French version of item 410B specifies equipment for recovering "coal tar or coal gas." He further cites other classifications in which the adjective modifies both terms in a compound phrase. For instance, "rubber boots and shoes" means "rubber boots and rubber shoes." The Tariff Board has turned a deaf ear to the initial plea for a new interpretation. But it's likely that the companies will institute a test case, appeal to the Exchequer Court if necessary for a legal decision.

If they have their way, Canada's Eastern fabricators will take the play away from U. S. firms doing a flourishing business selling equipment to western Canadian gas processors.

A new mass flowmeter for solids has been introduced by Industrial Powertronix, (Portland, Ore.). It's called the IPI Dry-Flow Meter, is available in seven sizes. The smallest device measures flow down to 5 lbs./minute; the largest, up to 3,500 lbs./minute. The meter has been tried on a variety of materials (carbon black, pelletized products, wood chips), is said to provide accuracy within 1%.

Technology

Newsletter

(Continued)

Details on the instrument are slim. Apparently it works on a principle similar to that employed in Wallace & Tiernan's Masometer (*CW April 29, p. 92*). The difference is that the new instrument does not employ a motor. The only moving part is an air bearing; the flow pressure is translated to an electrical current by means of a transistorized electronic unit incorporating a piezomagnetic transducer.

More word soon on Du Pont's Tedlar Polyvinyl fluoride film.

The firm is moving out of the pilot stage, will probably report shortly that it is building a commercial plant to be completed within a year. The film features unusual resistance to weather as well as to a number of chemicals.

One application for the film is expected to be revealed shortly: American Sisalkarft Co. (a division of St. Regis Paper) has developed a laminated facing material consisting of aluminum foil, glass-reinforcing strands and Tedlar. This material is intended to provide extra-long life for outdoor piping insulation.

A shipment of Sabin vaccine may help stave off a polio epidemic in Atlanta this summer. U. S. Public Health officials have estimated that 200-600 Atlanta residents may contract polio this summer unless a mass vaccination program gets under way immediately. This week Dr. Albert B. Sabin shipped 300,000 doses to Atlanta, the entire stock of his Cincinnati headquarters. Atlanta health officials would happily have settled for Salk vaccine but prefer the oral vaccine because of the speed element, the elimination of need for sterile needles and syringes. Lederle, which supplied Sabin vaccine for large-scale tests in Miami last year, reports it had no commercially available stocks to meet Atlanta's emergency.

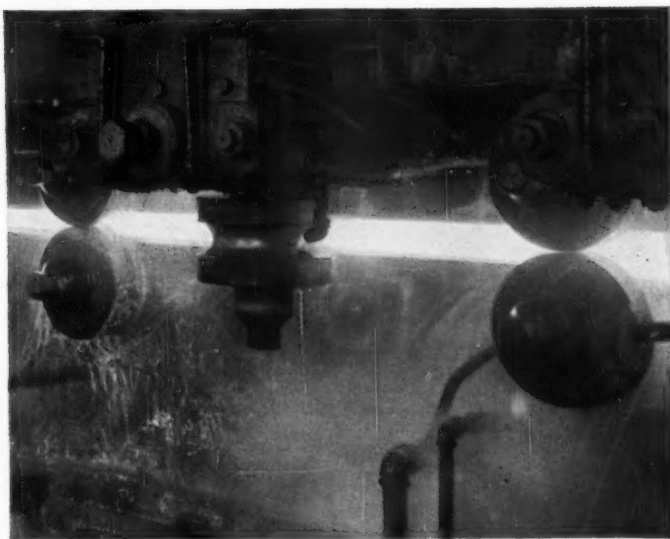
Schering Corp. last week introduced a new calming agent,

Tindal (acetophenazine dimaleate), said to be particularly useful in treating cardiovascular patients who must slow down their activity. The drug has been evaluated by more than 400 physicians on several thousand patients. Findings: highly effective in alleviating symptoms of anxiety, tension, extreme nervousness, mild depression and insomnia in elderly cardiac patients. Evidence so far indicates a low order of side effects.

A soil analysis of the moon? Aerojet-General's Chemical Division (Azusa, Calif.) is working on a lunar chromatograph, a small (8X8X10 in.) remote-controlled black box. Aim: to land it on the moon using NASA's Surveyor spacecraft. A drilling rig would feed finely ground lunar rock into an oven, and gases from the oven would be flushed into the chromatograph, which would relay its findings back to earth.

Goal: to determine presence of organics such as amino acids and other compounds that may have been the essential starting materials for life forms on earth.

SECOND-HALF '61: THE CPI GETS UP STEAM



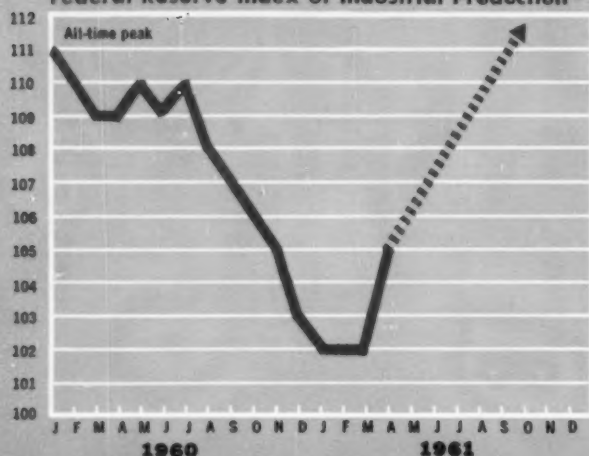
JONES & LAUGHLIN STEEL CORP.

The steel industry's rising fires (*above*) symbolize the quickening pace of the U.S. economy. Chemicals rode out the recent recession better than most industries and should post record sales in the next six months. But some regions of the country are still depressed, and overcapacity in several product lines continues to pressure prices and pinch profits.

CW SPECIAL REPORT

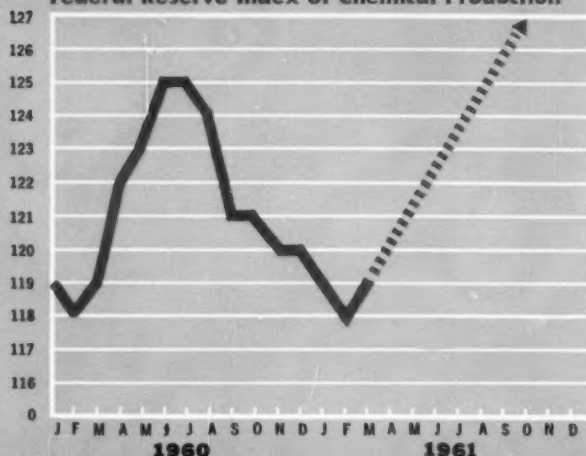
PRODUCTION IS PICKING UP

Federal Reserve Index of Industrial Production*



* Seasonally adjusted total (including utilities); 1957=100.

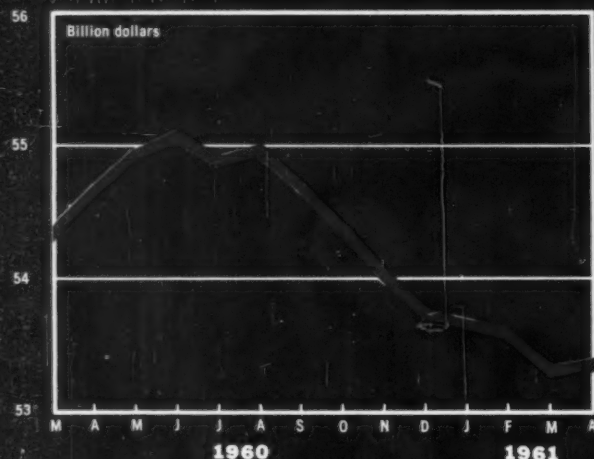
Federal Reserve Index of Chemical Production*



* Seasonally adjusted; 1957=100.

INVENTORY REDUCTION HAS HALTED

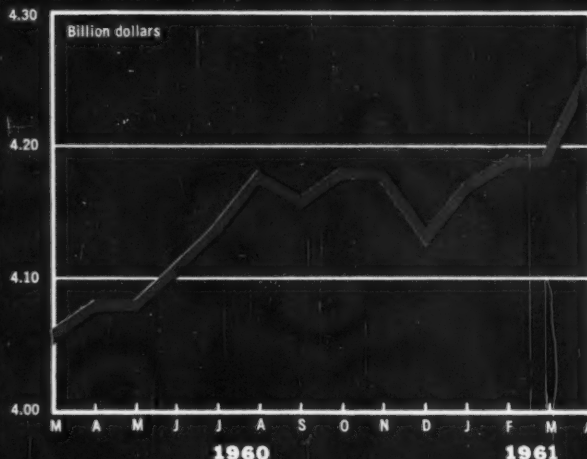
All Manufacturers



Source: U.S. Dept. of Commerce.

Inventories (seasonally adjusted)

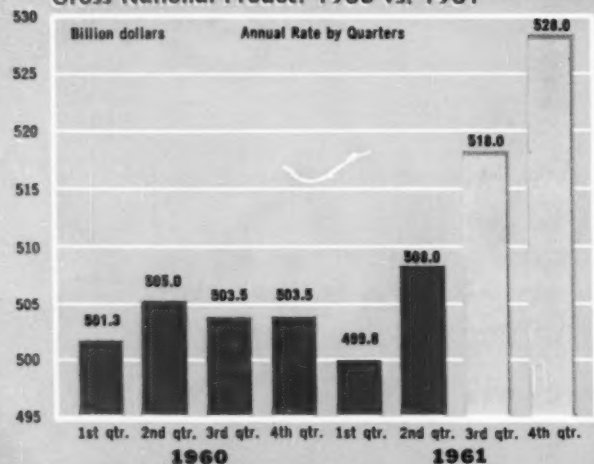
Chemical Industry



Source: U.S. Dept. of Commerce.

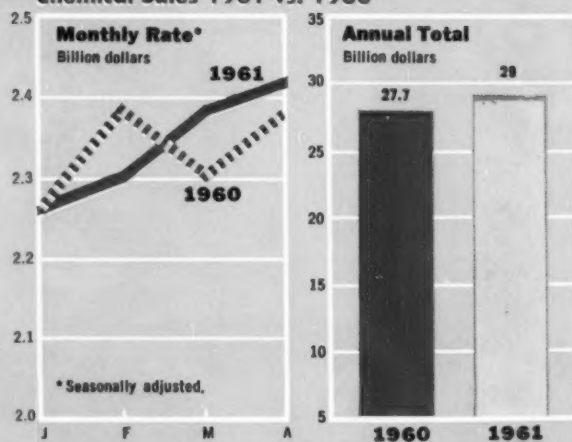
AND A RECORD YEAR IS IN THE MAKING

Gross National Product 1960 vs. 1961



Source: U.S. Dept. of Commerce; CW.

Chemical Sales 1961 vs. 1960



Source: U.S. Dept. of Commerce; CW.

Shaping Up Now: Good Year for the Chemical Process Industries

As the first half of 1961 is about to pass into history this week, it's clear that things are looking up—for the economy as a whole, for industry in general and chemicals in particular. Some worrisome, persistent problems regarding prices and profits remain. But production activity has picked up; manufacturers have reversed the trend toward lowered inventories; gross national product and chemical sales are headed for new highs (*charts, p. 112*).

Final figures on the first half will not be available for several weeks. But there is ample evidence to permit some qualitative judgments on the recession that hit the country toward the end of last year and continued into this. And there's sufficient data now to permit some meaningful projections for the full year, to sharpen and polish predictions made six months ago (*CW, Dec. 24, '60, p. 31*).

Qualitatively, it's clear that as recessions go the 1960-61 version failed to make a big name for itself. The drop was not so severe as had been anticipated; it bottomed out sooner and recovery has been friskier than expected. Some industries (e.g., steel) were hit hard, but on the whole, chemicals emerged relatively unscathed.

Quantitatively, evidence is mounting that 1961 will break some records. Annual rate of the gross national product fell from \$503.5 billion during the third and fourth quarters of 1960 to \$499.8 billion during the first quarter of 1961. It has picked up now, probably to a \$508-billion rate in the second quarter. GPN should hit a whopping \$528-billion rate for the fourth quarter.

The Federal Reserve Board Index of Industrial Production seems certain to hit a new high this year, probably between September and November.

The chemical industry and other members of the CPI should do better than the average. Total sales of chemicals should increase 5%, to \$29 billion. The CPI's sales should increase 3%, to \$96.5 billion.

No Change in Problems: There are, of course, a number of problems that the chemical industry will have to live with for some time. For instance, there is no indication that the pressure on profits will diminish. Rather, costs are continuing to rise and chemical prices are being lowered or held on an even keel.

Overcapacity in many lines will continue to exert downward pressure on prices. And the market pattern for some chemicals that have been tight will change abruptly. Benzene, for example, will soon be available in quantities more than sufficient to meet foreseeable demand for years to come. And expanded petroleum naphthalene capacity will assure an embarrassing surplus of a now-scarce commodity.

Overcapacity in plastics (primarily high-pressure polyethylene) has sparked price reductions that are hurting producers. Growth of synthetic detergent demand has not come close to matching increases in phosphate capacity, and phosphate producers are singing a familiar song of falling prices and profits.

These are all serious problems, but they are not directly connected with the health of the economy as a whole. They mean that chemical industry profits this year will not swell with the increased volume of business. The encouraging aspect is this: austerity programs initiated during the recession eventually should pay off handsomely in increased profits. Next year, chemical-company stockholders should see returns that can support them in the manner to which they have become accustomed.

THE NATIONAL ECONOMY

In sum, the big picture for chemicals this year is bright. A look at the nation's over-all economy helps to fill in the details.

Right now, there are approximately 67.25 million people employed in the U.S., the all-time high. By the same token, the total civilian labor force is about 72 million, also a record. So there are 4.75 million un-

employed, or 1.25 million more than there were a year ago.

Consumer disposable income is also at a record high, approximately \$361 billion, reflecting a \$6 billion increase between February and May.

By these fundamental yardsticks then, the economy is in good shape. The trouble is overcapacity. The industrial building spree has continued since the Korean War, almost without pause. As a result, manufacturers who normally like to operate at 94-95% of capacity, are only able to achieve an estimated 77% now. Result: a reduction in new-plant investment.

The pick-up has been possible only because a large portion of the country's industrial plant is obsolete. Significantly, the lion's share of new capital this year (70%) will be used to replace facilities rather than to erect new capacity.

Helping too is a continuing stream of new products, a direct result of the surge in research spending by all industry during the '50s.

The recent recession can trace its roots to many causes. Manufacturers chopped inventories—at a \$4.5-billion/year rate. Consumer debt hit what economists feel is the danger point last December when repayments came to 13% of consumer income after taxes. The consumer was loathe to take on new debts. Moreover, he was better stocked with durables (appliances, television sets, radio) than at any time in history. And the new models were not sufficiently different to offer potential customers much of an inducement to buy.

First-quarter figures now available show that consumer debt has dwindled; repayments on old debts exceeded extensions of new credit. Consumer borrowing is likely to increase again in the coming months, and this will mean more demand for durables. It will not, however, be of boom proportions.

Consumer purchases of soft goods (apparel, food, drugs) increase as a function of the population and number of families. So spending on that score has not been affected to any extent by the recession, or accelerated by the recovery.

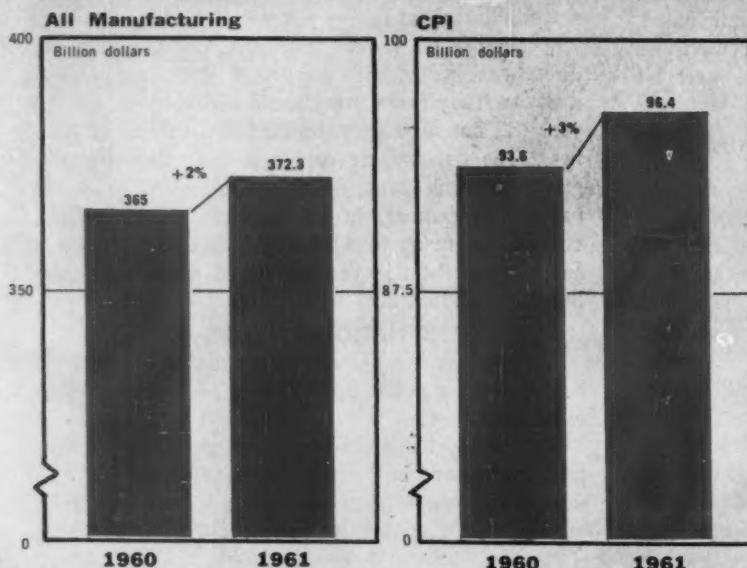
It boils down to an increase in consumer spending for all goods and services of \$10 billion before the year is out.

Government's Role: Increased spending by government—federal, state, and local—will help boost the economy this year. For the first time in history, government spending will top \$100 billion; the second-quarter rate of \$106 billion will likely grow to \$109.5 billion in the fourth quarter. Most of this increase will be at the state and local level, although a large portion of it will be for federally financed programs—roadbuilding, housing, educational facilities and increased unemployment insurance coverage.

The current rate of defense spending is \$47.5 billion. Although this is being stepped up, the net increase in the six months coming will be relatively modest.

Balance of Trade: A third significant factor in gauging the upcoming half year is import-export activity. Exports, which skyrocketed last year, will probably

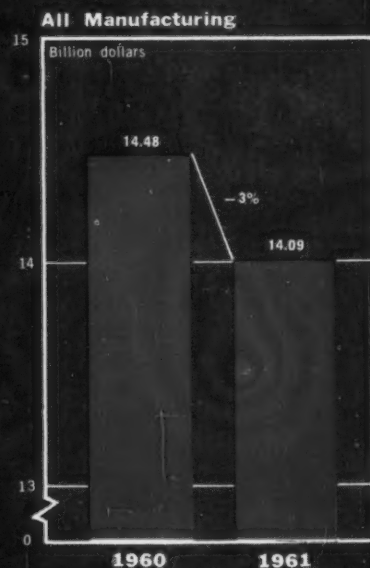
CPI* SALES WILL RISE FASTER THAN ALL MANUFACTURING'S



Sources: U.S. Dept. of Commerce; CW.

*Includes government classifications chemicals and allied products; pulp, paper and allied products;

AND CPI CAPITAL SPENDING



Source: CW.

rubber and allied products; products of petroleum and coal;

CW SPECIAL REPORT

CPI GETS UP STEAM

show a 4% gain this year. Most of this, however, has already taken place. Imports will increase slightly, and the rate will parallel the business recovery. Outlook: balance of trade will shrink from about \$4 billion this quarter to \$2 billion by the end of the year.

This small drop in the balance of trade, however, will be more than offset by increased spending on the part of consumers, government and probably industry as the recovery gathers steam.

IMPACT ON THE CPI

Increased spending will mean growing demand for most of the major products of the chemical process industries. Most segments should show gains. Important to watch, however, is spending for new housing and automobiles.

New housing starts fell off dramatically toward the end of last year and the first-quarter rate this year was only 1.15 million. Easier money is almost certain to hike this figure. But no housing boom is in sight. The population's present age distribution indicates a relatively slow rate of new family formation. What's more, the vacancy rate continues to inch up, so that compared with recent years, there's a relative abundance of housing available.

Nevertheless the rate of new starts should increase by 200,000 units by year-end. This means a spending increase of \$2.5 billion between the second and fourth quarters. It also means stepped-up demand for appliances, and gains for plastics, coatings and other

chemicals. An increase in other construction activity will boost sales of chemicals for cement, glass, and metals processing.

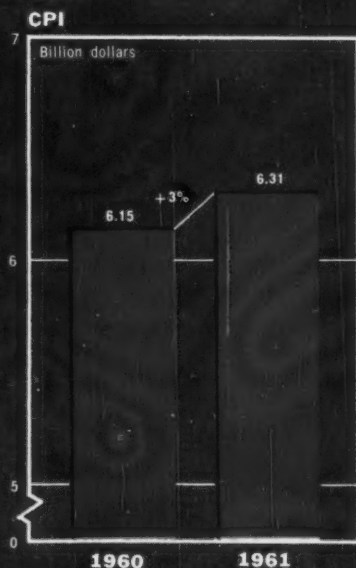
Auto sales, domestic and foreign, were running at an annual rate of 5.1 million units for the first quarter. This has been rising, however, and will probably reach 6 million units in the last quarter. Even so, it will not add up to a really big year for automobiles—which, will be reflected in sales of many items: coatings, synthetic fibers, metals and glass. In the case of plastics, however, the effect will be at least partially counterbalanced by increased use of plastics; manufacturers estimate this year they'll use more than 30 lbs./car.

One Down: Synthetic rubber will suffer most from reduced auto production. Sales of tires for new cars have been considerably below those of last year; replacement tires are providing the major demand. The expected increase in automotive production should help. Industrial rubber consumption follows industrial production in general, and this segment too should improve. Over-all 1961 sales will be 2% off 1960's.

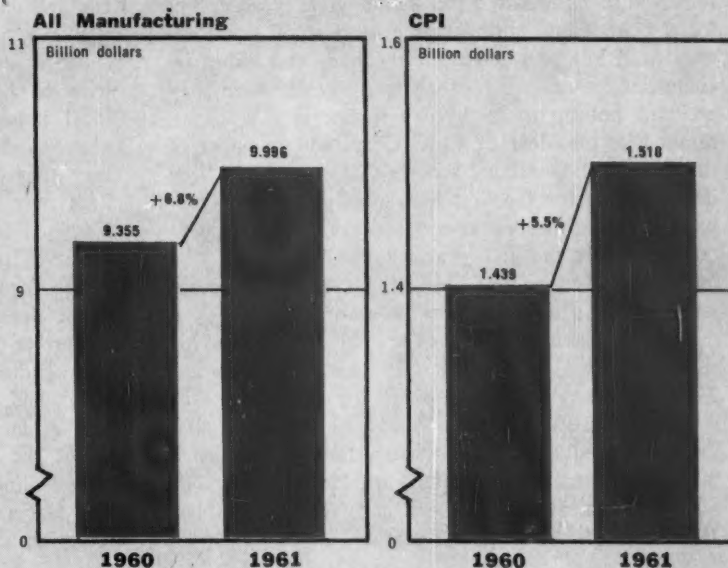
More to Grow: Sales of paper for books and magazines will grow substantially as will use of paper in packaging. Sales of paper (and paper chemicals) will probably show a 5% gain this year, compared with 1960 sales.

The pharmaceutical industry will reach sales highs this year. At the same time, rate of growth of plastics will slow down, but total sales volume will still show an enviable 6% gain.

IS GROWING FASTER TOO



... BUT RESEARCH SPENDING IS NOT



Source: CW.



EAST—Moods range from optimism, in New England, to concern, on the Niagara Frontier.

To a large extent, of course, the outlook for chemicals during the next six months depends upon the area of the country you're talking about. Chemical executives on the New York-Wilmington axis, for example, range in tone from cautious optimism to actual enthusiasm. A DuPont spokesman reports that May of last year was the best month in the company's history, and the low point was reached in December. Things have been picking up since. Union Carbide's first-quarter sales were off 8% from the first quarter of 1960; net income was down 20%. But the company reports that March of this year was better than either January or February, expects the pickup to increase as the year progresses. Says Board Chairman Morse G. Dial: "We're not anticipating any . . . boom . . . but rather a steady general improvement."

Allied Chemical notes a general recovery in all lines. Nitrogen would have had a great year except for a cold, damp spring and instead is off considerably from last year. Dye intermediates and industrial chemicals are showing strong recovery although they are still not up to last year's levels. Bill Williams, senior vice-president of FMC Corp. and manager of the Chemical Divisions, reports that sales have been disappointing for the first four months and the company is facing the "usual cost squeeze." "We hope to do better for the full year, though," he says, "by increasing sales volume, installing cost-saving equipment and by a rigid economy program."

Stauffer Chemical's Hans Stauffer has drawn his sights on 1961 by segment. He sees sales gains of: 2-3% for heavy chemicals; 4-5% for synthetic resins; as much as 10% for major industrial organics; 10% for pharmaceuticals; 1-2% for agricultural chemicals; 2-3% for cosmetics and detergents. He foresees modest gains for synthetic fibers and synthetic rubber sales about the same as last year's.

American Cyanamid says the slump was felt pretty generally throughout the company but that the worst of it is now history. It has had a good season with agricultural chemicals but for over-all company totals this year is not as good as last; 1960 was unusual due to Lederle sales during the flu epidemic.

Report from Boston: Chemical executives in the Boston and New England area are almost unanimous in their feelings of confidence for the next half year. Robert Hassett, of New England Council, says that a plastics industry survey points to the possibility of a record production. Last year, the value of plastic output in the region came to \$500 million, a \$52-million boost over 1959. "We can attribute much of this to our booming electronics industry," Hassett says.

Harvey C. Krentzman, president of Advanced Management Associates (Boston) surveyed six chemical process companies, concludes: "Backlogs are beginning to pile up and inventories are being worked off, so we are now preparing to step-up production."

A spokesman for Technical Operations, Inc. (Burlington, Mass.) predicts substantial output boosts within the year for new non-gelatine photographic film made by a vacuum process. Wasco Products, Cambridge, Mass., plastics firm recently taken over by American Cyanamid, reports "optimism, companies all set for expansion up here."

An investigator for Arthur D. Little, which is conducting a survey on the ten-year outlook for chemicals in New England, reports the industry is "healthy . . . growing at a rate of 4.5%/year, mostly due to a number of small specialty firms." He feels the percentage will pick up soon, sees growth in plastics, paints, varnishes, specialties.

Roger Johnson, economist with Associated Industries of Massachusetts, reports that a sampling of local industry shows chemical orders running 3% ahead of last year's pace. "If things keep going the way they are," he says, "chemical industry orders here may average 3-6% better than last year. And Edwin Estle, industrial economist for the Federal Reserve Bank of Boston, sees a particularly bright future for cryogenic gases to supply growing needs of the electronics industry."

Farther West: In the busy chemical area starting with Buffalo-Niagara Falls and extending to Pittsburgh and Cleveland, optimism is not quite as rampant. A large chlor-alkali producer says it is doing about the same level of business it did last year, expects improvements in the third and fourth quarters. But a neighboring firm complains that the recent recession was worse than those of either 1954 or

1958 because of the high level of capacity pushing down prices and because of the low steel operating rate, which caused a shortage of naphthalene and phthalic anhydride. It says the first quarter was very disappointing and April was not much better. It has high hopes but admits having little basis for them.

Niagara Frontier: The Buffalo-Niagara Falls area was hurt by the recession. Unemployment in the area in the early spring was 60,300, the highest number of jobless there since the transition period following World War II. Niagara Falls was worse off than Erie County (Buffalo), with 13% of the work force idle. The Niagara Frontier, in fact, came close to qualifying as a distressed area under the government formula.

The trouble stemmed from depressed condition of the automotive and steel industries, which made itself felt on the metallurgical, ferro-alloy, chemical and abrasives producers in the area. The 1956 rockslide that destroyed Niagara Mohawk's Schoellkopf generating station, and caused power rates to go from as low as 3 mils/kwh. to as high as 7 mils/kwh., didn't help matters either.

But things are looking up. Latest report of the New York State Labor Dept. (May 25) shows that employment had risen 4,000 in mid-April, the second consecutive month in which a gain was scored. Most of the gain was in non-manufacturing employment. However, plant employment held steady for the first time since last September and total unemployment dropped to 10.6% of the labor force.

The power situation will improve too when the State Power Authority's new Niagara generating facility, now in partial operation, hits full stride. Its industrial power is expected to go for 4.6 mils/kwh.

Union Carbide Metals, one of the largest industries in the area (it employs 2-3,000 people), had been making fairly heavy lay-offs, severing workers having up to 15 years service. William Feathers, the company's president, on a recent visit to the plant, pointed out that the ferro-alloy business has become increasingly competitive and capacity is enough to serve more steel tonnage than is predicted for at least five years. He added that until the excess capacity can be taken up, the emphasis would have to remain on economies of the processing.

Plant manager F. L. Evans told *CW* last week: "Production levels have not increased to any great extent. The increase in steel operating rates is encouraging, but spokesmen for steel are cautious, particularly in view of the normal summer steel slump." On a brighter note, he reports that approximately 45 people are being recalled to work for short-term

projects. "We may operate an additional calcium carbide unit within the next few months, but that depends on whether or not demand holds up. That, of course, would enable us to retain some of the workers now being called back."

Hooker Chemical (whose fiscal year ends Nov. 30) says its second quarter is following the pattern of the first, but it's hopeful about the next two. Gen. (Ret.) Clinton F. Robinson, president of Carborundum, reports "business was off during the first quarter, but has picked up slightly and should get progressively better." Foreign sales have been holding up and, over-all, he looks for a 1961 volume close to that of 1960.

On the other hand, Donald A. Miller, manager of Du Pont's Electrochemicals Dept. plant in Niagara Falls sees "no appreciable pick-up." He gives this rundown on some of the products made there: Some chlorinated solvents (e.g., trichloroethylene) are off as much as 25% from last year, but sales of methylchloride, methylene chloride and chloroform are holding up. Sodium is off slightly. Tetraethyl lead, polyvinyl alcohol and sodium peroxide are down. The first half, he declares, was slightly worse than the same period last year but the next half should be better—the net result will be a year comparable to 1960.

Frank Manchester, manager of Goodyear's Niagara Falls plant says there was a "decided spurt" in March and the work force was increased 5-10%. He terms business now "very good." Vinyls are doing better this year than last; rubber chemicals have increased moderately but will level off to last year's rate, or possibly slightly above. Stauffer Chemical's Niagara Falls plant is doing "no worse than last year with a better than seasonal pick-up in the last two months." The outlook is "good" for the next six months.

Donald Keenan, vice-president and general manager of Varcum Chemical, feels his firm is in a "pretty good position," expects it to be even better before the year is over.

On the other hand, International Minerals & Chemical Corp. reports business down 9-10% early in the year before a pick-up in May, which made things "livable." Its forecast for the next 12 months: no great improvement; level of operations will be 8-9% below normal. Riverside Chemicals (North Tonawanda) also reports a significant drop in business but hopes for improvement during the third and fourth quarters.

And despite the general optimism for the paper industry, paper companies in the Niagara Frontier are

faring no better than other industries.

Focus on Steel: In Pittsburgh, comments are about as varied as those from the Niagara Frontier. Avery C. Adams, chairman of the board of Jones & Laughlin, is now upgrading his estimates of 1961 steel production to 98 million tons (from 95 million tons). He feels that the industry will produce 118 million tons between July 1, 1961 and July 1, 1962. He says unshipped orders are now 36% higher than at the low point, Feb. 14, this year.

The uncertainty about steel is price. With a wage increase due on Oct. 1, this year, it's likely that steel prices will be boosted. This, in turn, will have an inflationary effect on other industries and will do nothing to make life easier for chemical men already struggling with the tight spread between costs and selling price.



MIDWEST—Chemicals vary with steel (picking up) and automobiles, having a just-fair year.

Reports from Cleveland indicate the economy is on the upswing, but business and profits leave a lot to be desired. A highly diversified manufacturing center (there are some 5,000 manufacturers in the area), it's mainly concerned with capital goods—steel is important, so is automotive supplies, not finished cars.

In steel, the first quarter was well below last year's. The industry confidently expects improvement, cites a high level of incoming business. Automotive parts were down approximately 15%; but business has picked up since April and will probably continue to rise until model changeover time.

Fabricated metals were down some 20% from last year in the first quarter and although hopes vary the consensus is that the full year will turn out to be 5-10% better than 1960.

Chemical companies have fared better than most. Harshaw (whose fiscal year ends Sept. 30) reports first-half sales down only slightly from last year but profits

off 30-40%. It expects the full-year report to be somewhat better.

Harry Clark, director of sales for Diamond Alkali, is sure that the next six months will be an improvement over the last six. Smaller customers are ordering well now, a good sign, and sales and profits are approaching those of 1960. He reports a good year for agricultural chemicals; soda ash, normally slow to react, is rebounding surprisingly; sales to the flat-glass trade are off, but bottles are doing well, and housing is up. Polyvinyl chloride is a problem area, however; volume will be up in the second half but price softness is a source of headaches.

Ferro Corp. echoes the familiar report of a first half lower than last year's but a second-half shaping up to be as good as, or slightly better than, last year's. Appliance manufacturers, buyers of the firm's porcelain frits, are not doing as well as Ferro would like. It hopes that new developments—e.g., coin-operated dry-cleaning machines—will give the industry a shot in the arm.

Cars and Detroit: Statistics from Ward's Automotive Reports show passenger cars being produced at the rate of 18,500/day in mid-May; total production for the year (which will end around mid-July) should be 5.4 million. This would be 10.8% below 1960 model runs, 3.7% below 1959, but 25.8% above the 1958 recession year. The total tonnage for plastics, rubber, coatings, and other goods will be lower than the figures indicate, however; the 10 compact cars may account for 35% of the 1961 model production, an increase over the 26.2% share the preceding year.

Chemical companies in the area are doing fairly well. Dow (whose fiscal year ends May 31) estimates sales at \$820 million, a substantial increase over the previous year's \$781 million. Profits will probably be down from \$82 million to something over \$60 million. This drop, however, reflects in part a large (\$150 million) capital expansion. For the coming year, the expenditure will probably be only half that, and the profit picture should be considerably better.

Wyandotte characterizes its economic background for the past year as "outstandingly stable". Its first-quarter sales were off slightly, profits severely. But it expects business by the end of this month to be running about 4% ahead of last year's, and looks for real strength to materialize in the second half.

Pharmaceutical companies are confident. Parke, Davis showed a drop in the first quarter but expects a good year, thanks in part to new plants starting up in the U.S. and overseas.

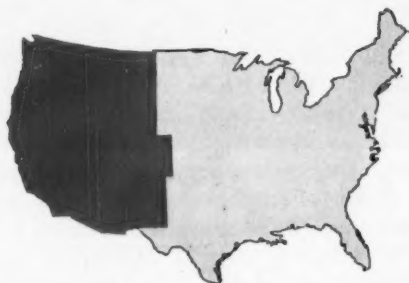
St. Louis, Chicago: From St. Louis, Monsanto gives a "reasonably optimistic" outlook, with the prospect

of the gross national product reaching the "high 520s" (billions of dollars) in the final quarter of the year. The upturn for its products occurred in the latter part of the first quarter, has continued into the second. It feels the turning point has been reached for most of its product lines.

In Chicago, steel officials are as optimistic as their counterparts in Pittsburgh and Cleveland. Inland Steel reports steelmaking operations at the highest levels since April of last year.

Zonolite Co., a major producer of vermiculite, reported a decline in sales and earnings for fiscal 1960 because of a decline in building and the squeeze on profits. But it says that efforts to broaden the market for vermiculite in building and agriculture resulted in marked improvement in the second half of 1960, which is continuing through the first half of this year.

George R. Cain, president of Abbott Laboratories, states: "We are forecasting moderately improved sales and earnings in 1961. First-quarter results were down from 1960, the second quarter will run about even or slightly behind last year, but the third and fourth quarters should show a higher level and better earnings."



FAR WEST: In Intermountain area, a quick rebound; in southern California, activity.

The Intermountain area, hurt less by the recession and wet spring (which bothered some fertilizer makers) than the rest of the country, looks forward to a correspondingly more rapid recovery.

Important new expansions are under way in phosphates and in potash. New highs were also reached by the area's nitrogen producers.

U.S. Steel, for instance, reports all-time records for sales of nitrogen products during the 1961 fertilizer season. (U.S. Steel, however, ships a substantial amount of nitrogen and chemicals to the West Coast.) Nitrate producers as a group posted a 5% increase in

sales in the region over 1960. Western Phosphates, Inc. (Garfield, Utah) enjoyed record production and sales also, partly because a strike in the copper industry interrupted sulfuric acid from by-product operations of Garfield Chemical and Manufacturing (owned jointly by Kennecott and Asarco). Other producers of triple superphosphate in the area, J. R. Simplot Co. (Pocatello, Idaho) and Central Farmers Fertilizer Co., posted production and sales increases. On the whole, phosphate fertilizer production was probably 5% higher than in the 1960 season.

Producers of elemental phosphorus (Monsanto, FMC, Central Farmers Fertilizer) operated at, or near, rated capacity but complain of price and sales competition in the Midwest consuming area from producers in Florida and Tennessee.

The price of sulfur remained generally firm, although sales of sulfuric acid were reduced because of the switch by some uranium mills to an alkaline leach. Beryllium reduction plants, a possibility for Utah, will—it is hoped—take up this slack.

Bonneville, Ltd., was able to sell its products from the 1960 solar season and has added ponds and ditches, hiked pumping rates for this season. Texas Gulf Sulphur has started up its \$30-million Cane Creek, Grand County, Utah, mine and surface plant. It is shooting for 1.1 million tons of muriate of potash production in 1962, is considering a 50% increase thereafter.

In other expansions, San Francisco Chemical has completed the first phase of its beneficiation plant in conjunction with an open-cut phosphate rock mine. U.S. Steel and FMC are continuing work at their experimental plant at Kemmerer, Wyo., to produce coke from normally noncoking coal. Stauffer's Victor Division and U.S. Smelting Refining and Mining are moving ahead with a comparable unit at Midvale, Utah. A new firm has been formed by Salt Lake City businessmen to exploit the chlorine resources of the Great Salt Lake. Texas Gulf Sulphur is researching to extract magnesium and sodium chloride as a by-product of its Cane Creek operation. Hercules' Bacchus (Utah) propellant plant is expected to keep the area's economy healthy. Population increases, increased industrialization and expansion in general should help keep the Intermountain area out of serious economic trouble for some time.

Southern California: Announced expansions in Los Angeles for 1961 come to \$64 million thus far; that's just about double the figures for the comparable period of 1960. The area's economy is still about 26% dependent on defense business, and the airframe industry is steadily shrinking. The hope is that the slack will be taken up by the growing space and electronics industry

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and growing production of other durable goods. Total building and construction in southern California is progressing at a rate of about \$3.2 billion/year. This is off from the year-ago rate of \$3.5 billion. Homebuilding for the first quarter amounted to 31,694 units, off 8% from the first quarter of last year. Unemployment in March showed no signs of improvement and neither employment nor new housing starts appears to be keeping pace with the continuing population boom. An encouraging sign: help-wanted ads in Los Angeles newspapers have been moving steadily, albeit erratically, upwards since last October.

As for the chemical industry, Don Bedell chemical industry account executive, Union Bank, reports general "optimism regarding sales and profits," although he doesn't see any let-up in overcapacity. He does point out that the market for chemicals on the West Coast is broad rather than deep, sees growth possibilities for petrochemicals in general and plastics in particular.

Chemical activity in the area tends to support this view. Dow, Monsanto, Du Pont, Union Carbide and Allied already have established plastics supply bases and most are planning expansions. B. F. Goodrich increased its polyvinyl chloride capacity at Long Beach. Rexall has been building its business in PVC, ethylene, propylene, polyethylene, polypropylene, polystyrene.

Two major carbon black plants (by United Carbon and Continental Carbon) are due to start this year. Collier is still planning a petroleum-naphthalene plant and has been building up its position in agricultural chemicals. American Potash has boosted its stake in potash, sodium chlorate, salt cake and boron production. U.S. Borax, which showed a decline in profits, is raising capacity of primary and specialized borax facilities at Boron, Calif., and hopes that 1961 profits will "compare favorably with those of 1960."

Northwest: The area around Seattle, Wash., is still basically timberland and the timber industry is not particularly healthy at the moment. Demand started to climb several months back and prices began to rise. But resistance set in a few weeks ago and prices are now on the "soft side." A strong wave of residential construction would solve all problems, but nobody in the area can see any signs of that.

The region's chemical business can best be described as "spotty." American-Marietta is having some trouble with prices and its first quarter was down from last year's. Al Hendry, sales manager, says that present sales to paper industry are at least as good as they were last year but plywood and paperboard volume is down. He says May "looked a little better," but he shows no real optimism for this year.

Ray Hansen, division manager of the Borden Co., reports business substantially better than that of a year ago and expects the full year to be much better than 1960. He describes February, March, and April of this year as "very decent," May only "fairly decent."

Fred Armbruster of Dow says that the year to date is a little better than last year, which means it is at a record high. March saw an upturn that is expected to continue until a normal letdown late in the year.

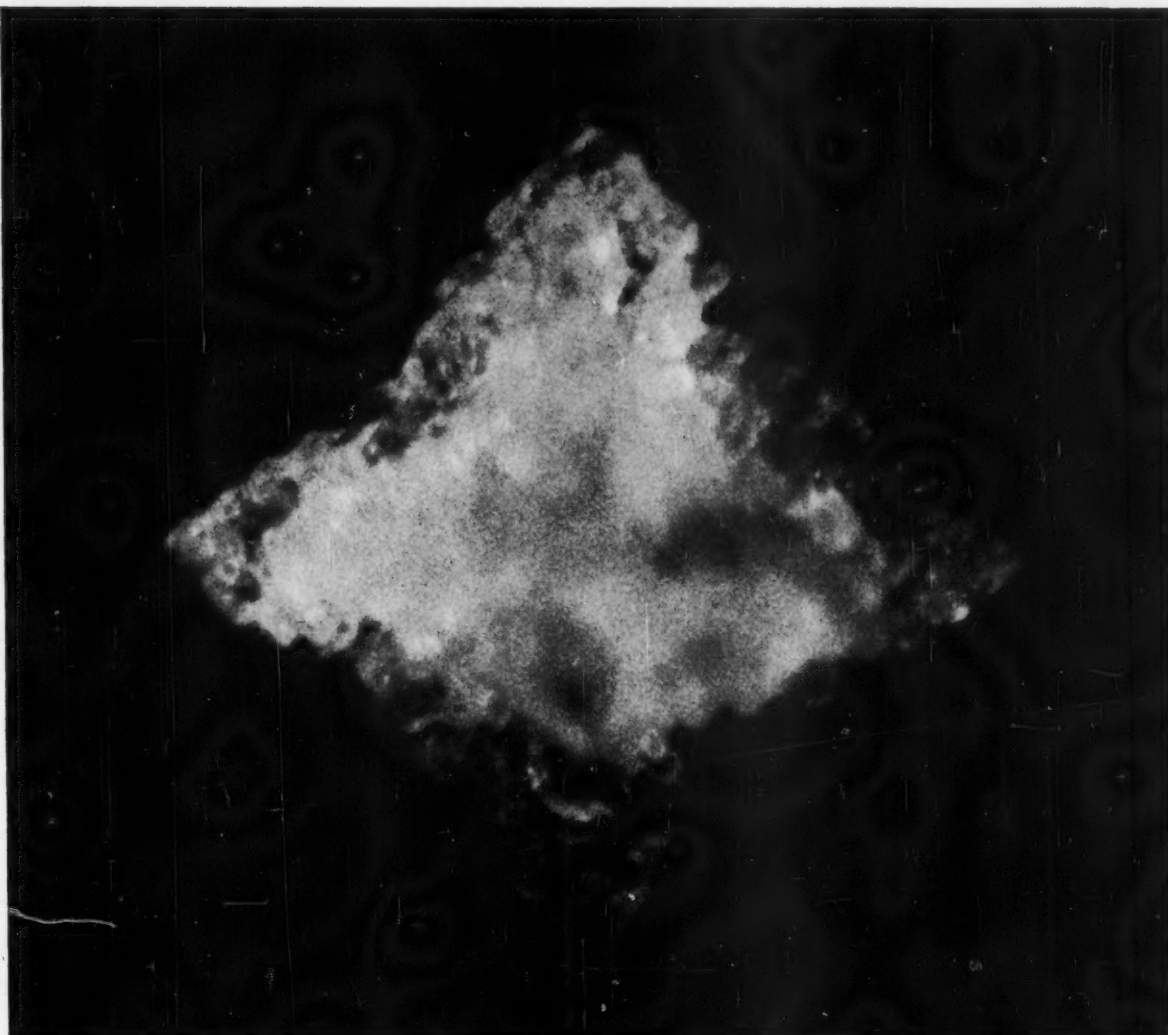


SOUTHWEST — Petrochemicals are getting a big push but overcapacity presents problems.

The petrochemical industry in the Southwest continues to grow but complaints of overcapacity and price-cutting are increasingly common. "Chemical volume," E. R. Baker, general manager of petrochemicals and research and development for Continental Oil, says, "should be appreciably better in 1961 than in 1960, but price-cutting has not stopped and profits may not be noticeably higher." John D. McPherson, president of Jefferson Chemical says, "Our sales in the first quarter were much lower than anticipated, although better than in the same quarter of last year. Business seems to have picked up and we are optimistic for the second quarter and for the full year. But profit improvement will remain a major activity as price competition remains with us. This is particularly true of the export market."

A plant manager for a major chemical company in the Houston area has "seen very few signs of improvement in the chemical business. . . ."

A sales manager, however, thinks the rest of the year "looks favorable" for business without much change in profits. Another sales manager reports business is humming at a nice pace, and feels it should continue that way for some months. He adds, however, "Some economists, including our own, are predicting a mild drop near the last quarter, extending slightly into next year."



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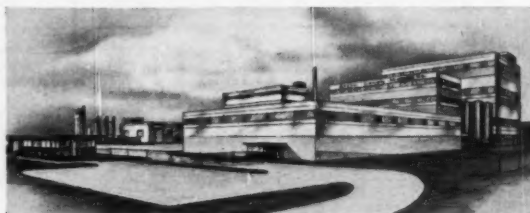
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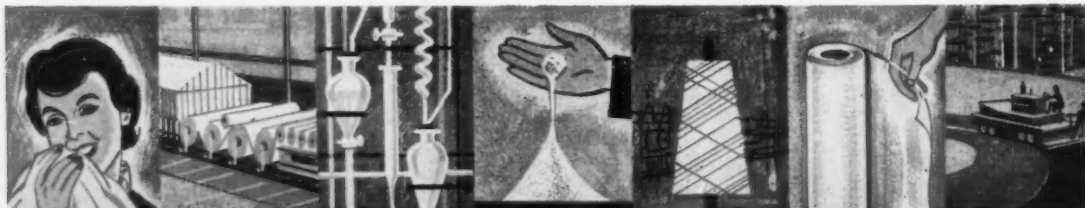
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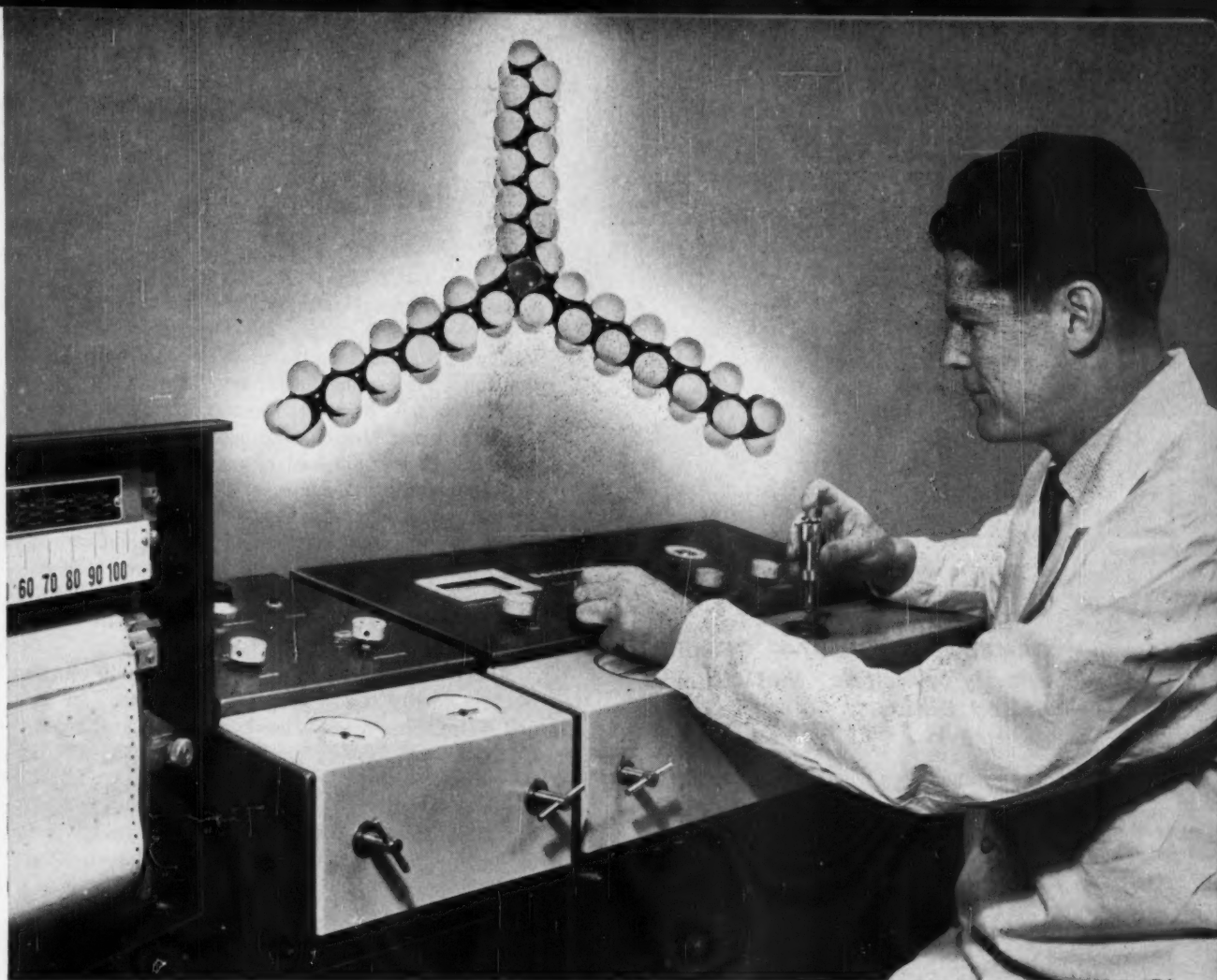
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CW SPECIAL REPORT

CPI GETS UP STEAM



CANADA, MEXICO — Chemical activity parallels that in the United States.

Not surprisingly, chemical business in other American countries closely parallels that of the U.S. No figures are available on Brazil—its national chemical manufacturers association is still collecting 1959 data. But industry people there feel that sales are running about 5% below last year's. They also feel that the total for the year will be up by the same amount.

In Mexico, the chemical industry is being hurt by current U.S. jitters regarding Latin American credit lines and investment. Chemical people are unanimous in their complaints of fall-offs in sales and collections, a resulting skid in imports.

The Canadian consensus is that the downturn in the last half of last year continued into this and that sales were about on a par with those of the first half of last year. However, most companies report a pick-up in the past month or two, expect it to continue throughout the year. The country hopes to boost its exports and cut back on imports.

Segments feeling the most pain are those that run directly into competition from imports. Plastics prices, in particular, have been off and profit margins at all-time lows.

Expansion, however, continues. Industrial chemicals firms have committed some \$125 million to new capacity this year, compared with \$90 million in 1960 and \$58 million in 1959. Much of it is going into petrochemicals.

A cutback in uranium production has hit sulfuric acid production (down 53,000 tons the first quarter) and sodium chlorate purchases (down 50-60%).

In the paper field, newsprint has been disappointing. There was a slight upturn in April, when production hit 87% of capacity. But this, according to Abitibi, probably won't change much for the rest of the year.

Chemical pulps have been doing well. Output, at 1.40 million tons for the first quarter was up 7%, thanks largely to an 8% increase in pulp exports (to 610,000 tons). As a result, bleaching chemicals are up 6-10%. There is, however, some concern about oversupply in bleached kraft and there's talk of a summer shutdown of four (instead of two) weeks.

Glass bottle manufacture has been growing steadily, and two non-glassmaking soda ash users (Ontarion Paper, for vanillin; Quebec Lithium, for lithium carbonate) have started up during the past few years. So Allied's Brunner Mond division is running with throttle out. Industrial gases rebounded from a poor fourth quarter, but are not up to last year's peak.

Ammonia continues to grow, from 110,000 tons in the first quarter of last year, to 131,000 tons for the first quarter this year. If, however, all planned capacity starts up without difficulty this year, there will be slight overcapacity. Otherwise, ammonia will be tight. Ammonium sulfate production was off 5%—probably because of reduced coke oven operations. Mixed fertilizer production was about even with last year's. But superphosphate producers indicate a surge in April and May improved output by 5-7%. In general, fertilizer exports are expected to be better this year than last.

Detergent output climbed to 63 million lbs. the first quarter, while soap dropped to 21 million lbs. (from 25 million). This has meant a 5% increase in chemical purchases, although makers of polyphosphates are about on a par with last year. Chlorinated solvents have been soft but this has been as much chronic as cyclical: Carbon-bed recovery systems (installed by 65% of the industry, estimates Dow) have upped the efficiency of dry-cleaning establishments.

Herbicides are not expected to match last year's record totals, but shipments so far would indicate the contrary. Polyethylene scored an impressive gain in poundage, offset by a 20% price cut last fall. Polystyrene is best described as "spotty." Exports account for 75% of the market and have been fluctuating widely. Vinyls have not been doing too well, but B. F. Goodrich says its sales have been holding up and, for the full year, expects a 5-10% increase in vinyl sales.

The rubber industry expected a record year in 1960 and didn't get it. But it feels the turnaround may have occurred this year, and the big rubber chemicals have been holding up and the feeling is that tire sales in 1961 will show a slight increase over 1960—from 8.37 million to 8.50 million units.

Paint sales lagged 2-3% behind 1960 sales for the first quarter, and indications are that the second quarter will be worse. The hope is for a fall pick-up. And pharmaceuticals seem to have lost momentum.

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CW SPECIAL REPORT

CPI GETS UP STEAM



EUROPE AND JAPAN: Capacity is increasing, but problems are starting to crop up.

Chemical sales in West Germany for the first quarter came to \$1.48 million, a 6.3% increase over the first quarter last year. Indications are that the full year 1961 will show a comparable boost.

This is a highly respectable rate, but it's disappointing to the Germans who have been spoiled by growths of 12-13%/year. Profits are shrinking, too. The 6.3% increase in sales represented an 8.6% rise in physical output; so prices (and profits) were down.

German chemical firms are beginning to feel the squeeze in profits brought on by the 5% devaluation of the Deutschmark in March. To remain competitive in the world market, German firms are forced to cut export prices up to 4%, and due to the liberal German policy on imports, they may have to cut domestic prices too. The full impact of the devaluation, however, will not show up until second-quarter figures are available. Similarly, trade figures are not too meaningful. Figures for only the first two months are available now. They show an 8% export increase, to \$259.7 million, an approximately 10% increase in imports, to \$100.9 million.

Great Britain: The British chemical industry fell off somewhat toward the end of 1960 but it's now back to the high levels of the first half. Outlook for 1961: a substantial increase in sales over 1960, though not as large as the 13% increase of 1960 over 1959.

What's really bothering producers is pressure on profits. Prices have been slipping, in part because of enlarged and more efficient plant, but mostly due to increased competition from domestic and foreign firms. ICI's home market prices, for instance, dropped an average of 2% last year. Labor costs and other items are increasing meanwhile, so that the net result may

well be no increase in profits, in spite of higher sales.

Last year, the U.S. increased its exports to Great Britain by 50%. British chemical men hope that their enlarged capacity and lowered prices, plus the U.S. chemical recovery, will be sufficient to prevent any such increase this year. Figures for the first four months—which indicate a small (approximately 3.5%) drop—encourage them on that score.

They also hope for a sharper export rise than the 8% in 1960, which they considered disappointing. But the figure for the first four months was only 7%, so they'll have to do some hard selling for the rest of the year. Big hopes are for stepped-up sales to Europe, both to the Common Market and EFTA. They're pushing hard too for more sales to the Soviet bloc.

France: The French chemical industry is slowing down to catch its breath. Production and sales increased 16-18% last year; for the first quarter of this year, they were up only an estimated 7%. Industry people explain this by saying that no industry can maintain the phenomenal growth that has been characteristic of French chemicals. Also, they point out that the bulk of last year's growth showed up in the second half, so that first-quarter figures may be deceptive.

Italy: Few figures are available on performance of the Italian chemical industry this year. But during the first three months, production was 9.1% higher than that of last year. Outlook: an 8% rise over the rest of the year.

Petrochemicals continue to get the main push. Tonnage by 1962 should be almost 2½ times that of 1959. Synthetic rubber, carbon black, plastics, and aromatic chemicals are getting capacity boots. The present rate of investment indicates a continuation of growth.

The export-import picture is not too meaningful now. Chemical imports should logically decrease this year as Italian capacity grows. But demand is surging so fast that some feel continued large-scale imports from the U.S. will be needed.

Japan: Japan's chemical industry is stepping-up its pace to comply with the Ikeda government's plan to double the gross national product starting this year. This means, says a recent "white paper" issued by the science and technology agency, that chemical production in 1970 will have to be triple what it was in 1960. About 50% of the total will be in petrochemicals.

And late last month, the Chemicals Export Council of the Ministry of International Trade and Industry decided on the fiscal-1961 chemicals export target: \$191 million, up 26% over 1960 exports.



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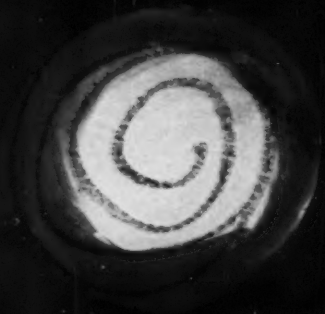


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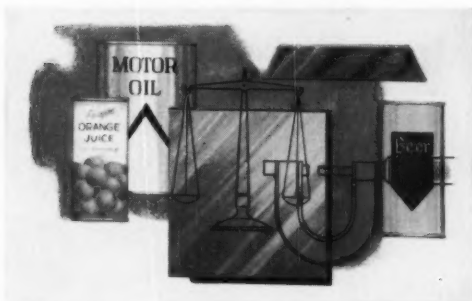


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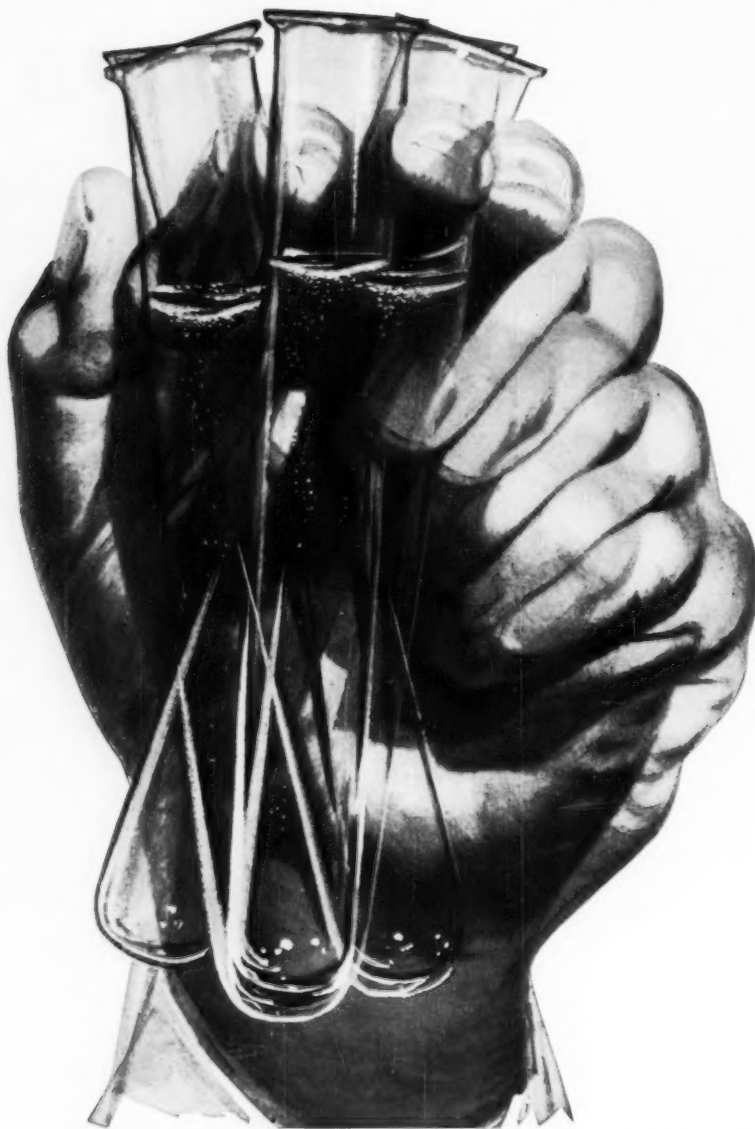
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Achema's Kuppelhalle, main indoor exhibit area, housed only a fraction of 1,400 equipment displays.

Under Big Top at Achema

100,000 chemical industry representatives from all parts of the world converge on Frankfurt, Germany, for technical information exchange—continental style.

Last week, Achema completed the most successful nine-day run in its history. The once-every-three-years gathering in Frankfurt, Germany, drew over 100,000 representatives of the chemical process industries and equipment makers from throughout

the world to discuss advances in technology and show their wares.

But it raised one question: Can Americans continue to ignore the largest chemical show in the world? Fewer than 800 Americans attended.

Although exact figures aren't avail-

able, a *CW* on-the-spot reporter (see also p. 5) team estimates that fewer Americans were present this year than in '58, while total attendance surged over the 100,000 mark for the first time. And the show, 13th in 31 years, had more to offer visitors than ever



Achema's heaviest show piece, a 130-ton pipe section.

A big showcase

before. In a nine-day period, it provided a compact international forum on developments in chemical engineering and many related fields of technology.

The Achema (Ausstellungs-Tagung für Chemisches Apparatewesen) exhibition of chemical equipment was the keystone of six international gatherings under the management of Dechema, the German chemical engineering society. The other technical

gatherings: the European Federation of Chemical Engineering, the European Federation of Corrosion, the Isotope Research Society, Dechema and the German Chemical Society.

For Americans, it was comparable to holding the Chemshow and society meetings such as the American Institute of Chemical Engineers, American Chemical Society, National Association of Corrosion Engineers and the nuclear groups simultaneously.

The exhibit of chemical equipment alone was about three times the size of the American Chemshow. Almost 1,400 exhibits of firms from 17 countries spread \$18 million in equipment over 20 acres in 24 halls and four outdoor areas at the Frankfurt fair grounds. But Herbert Bretschneider, managing director of sponsoring Dechema, considered the equipment exhibit of less significance than the other activities.



Achema sponsor Bretschneider (center) discusses show with CW Editor-in-chief Johnson (left) and McGraw-Hill News Bureau chief Forbath in outdoor exhibit area between rain squalls that plagued show's first days.

Giant 50-ton evaporators in background rise to height of 50 ft., dwarf visitors walking through 20-acre show area.

for heavy process equipment

About 9,000 visitors (over half from countries other than Germany) attended 200 lectures on subjects such as plant design, control engineering, nuclear technology, process kinetics, materials of construction and safety techniques. Among the U.S. speakers: Donald Dahlstrom, research director and filtration expert from Eimco; Donald Othmer of the Polytechnic Institute of Brooklyn and consultant to the Office of Saline Water, U.S.

Dept. of the Interior (see p. 93).

In addition there were 35 tours of German chemical plants, 64 industrial film showings and several full-dress banquets complete with entertainment — e.g., the Frankfurt Opera ballet. And visitors even found themselves swapping technical and business information in hotel corridors, beer cellars, and over the gaming tables in nearby Wiesbaden's gambling casino.

Missing Out: Despite this world-

Foot-weary micro-analyst from Copenhagen University, Preben Hansen, sits beneath directions to exhibits.



On first day of show, Forbath interviews Herbert Guth (left), representative of Ruhrstahl, German equipment manufacturer, in front of a section of his firm's huge evaporator—one of many heavy pieces of equipment in exhibits.





Brooklyn Poly's Othmer readies for black-tie banquet.

wide information exchange, many of the American visitors did not view Achema as important from a business or technological viewpoint as the smaller U.S. offerings. And many U.S. firms that had planned to send representatives did not hesitate to cancel reservations because of economy drives stemming from the U.S. business slump. As a result, they may be missing out on an important facet of

chemical industry progress.

For example, Othmer, who attended as an honorary delegate from this country points out that Achema is important "for all students of chemical engineering. And, after all, we are still students if we are serious members of the world's chemical industry."

Jacob G. Mark, vice-president and director of research and development for W. R. Grace's Dewey and Almy

Chemical Division, says, "Achema is about the best way we have to get an idea of the major trends in European chemical technology." How Mark gets the most out of a trip to Achema and gives tips to first-time visitor, Roland Gray, manager of process development for D&A, is shown on p. 138.

Noncommercial: One reason for American lack of interest in Achema is the unfamiliar noncommercial fla-

Ballet, banquets



Frankfurt Opera Ballet group practices for entertainment portion of one of the several banquets that highlighted Achema's evening programs. Press, photographers were barred from banquet sessions.

European Federation of Chemical Engineering holds one of many meetings by society groups in conjunction with Achema

punctuate business sessions

vor. The official view of sponsor Dechema is that the fair is a place to learn and companies are restricted from indulging in splashy equipment displays and salesmanship. Most booths are manned by engineers and chemists rather than salesmen equipped to talk prices and delivery times.

While America's interest in Achema seems to lag, Communist-bloc inter-

est has increased. The manager of one of the banks (for currency exchange) located on the fair grounds noted that most of the business was with visitors from behind the Iron Curtain. The Communists were represented by uncommunicative groups that toured the show making copious notes. And nearly 25 East German equipment makers exhibited products.

Other interested visitors: a special

delegation from Japan anxious to get tips for putting together an Oriental version of a chemical show in Tokyo next fall. American attendees came away with at least one clear conclusion: there is no American monopoly in chemical shows. It's clear that U.S. firms will be under increasing pressure to send more representatives abroad to keep up with worldwide chemical developments.



show. Professor Winnacker, Farbwerke Hoechst, Bretschneider, Dechema managing director, preside at head of meeting table.

Dechema lecture group: Du Pont's Max Goebel (U. S.), Padova University's Ippolito Sorguto (Italy), Esso's Walter Guyer (England), Ghent University's Gaston Goethals (Belgium), left to right.



Dewey and Almy's Mark (right) helps assistant Gray with Achema's signs.

An American in Frankfurt— Making the Most of Achema

For most American firms, Achema, the Continental Chemshow that closed its nine-day run in Frankfurt, Germany, last week (see p. 133), has been of little interest. But for Jacob Mark, vice-president and director of research and development of W. R. Grace's Dewey and Almy Division, Achema—from its bewildering list of German direction signs to its Frank-

furt-style frankfurter snacks—has become an important part of doing business.

Mark, visiting his third Achema show last week, introduced assistant Roland Gray (D&A's manager of process development) to the Continental show. And his tour tips offer increasingly international-minded U.S. chemical firms a chance to find out

how to make Achema pay off.

In support of his belief that Achema is "about the best way we have to get an idea of the major trends in European chemical technology," Mark points out that the show is only the beginning. It only takes about two days to tour the show. Any additional time, unless it is required for certain lectures, is of limited value. The rest of a European visit can be spent more profitably visiting the European companies themselves.

Moreover, it is almost impossible to get to see top European chemical executives touring the show.

Little serious shopping can be done at the show, says Mark. For one thing, it usually is not economical to buy European equipment. Shipping costs wipe out price advantages; delivery times are longer particularly with the booming Continental economy. And there is always the question of equipment replacement parts and service.

Yet, the showing of equipment told the American visitor much about the technological growth of the European chemical industry. Most important: the heavy showing by instrument makers was evidence of the increasing interest in Europe in automatic control and the acknowledged leadership in this field by Americans.

Traditionally, Europe has been short on labor-saving devices, long on low-cost labor. But in Germany, for example, the situation is changing rapidly. There is a severe labor shortage; manpower is being imported from neighboring countries, and unions are pushing wages up in their sellers' market.

Although fewer than 35 American equipment firms were represented at Achema (and over half of these by European subsidiaries), the U.S. made a good showing in instrumentation. But European companies, as well as American, showed they are well aware of the surge of automation on the continent. Over 100 companies occupied more than 87,000 sq.ft. of space in measurement, control and automation displays.

And the European viewpoint that is gained from visiting the show can be highly important. For example, D&A is now interested in getting into the manufacture of a new plastic. Mark kept an eye open for process tips



Set for New York takeoff, Mark and Gray discuss trip with CW editor.



Checking into Frankfurter-Hof, Mark gets room assignment from hotel's head receptionist Herbert Seitz on morning following jet flight from New York.



Settled amidst plush continental style hotel decor, Mark and Gray discuss plans for the day's tour of Achema with McGraw-Hill Bonn Bureau's Forbath.



Mark, Gray leave on Achema tour with Gabler (left) from Zurich lab.

Americans inspect glass process equipment, pause for snack during show tour.

and equipment that might fit his firm's needs. When it comes time to do some definite planning on the project, he will discuss his needs with executives of European companies that have equipment and processes of interest.

Mark points out that a trip to Europe solely to visit Achema probably couldn't be justified. But representatives of American firms with international ties have other factors going for them.

D&A, in addition to the interests in several European countries, has a research laboratory in Zurich, Switzerland. The lab was set up to help the company broaden its thinking, develop new products and techniques without the restrictions of being too close to company headquarters.

Mark, who takes an average of three or four trips to Europe each year, does not expect to return to the U.S. until July. Mark and Gray, who are involved in work on a new process researched in Zurich, were met by a representative of the Zurich laboratory at the Frankfurter-Hof, Frankfurt's plush hotel. After touring Achema, they will travel to Switzerland, where Gray will remain until his part of the process development is complete.

Mark will leave Zurich after a short visit, stop at two plants in Germany and then travel to The Netherlands and England before returning to his firm's Cambridge, Mass., headquarters.

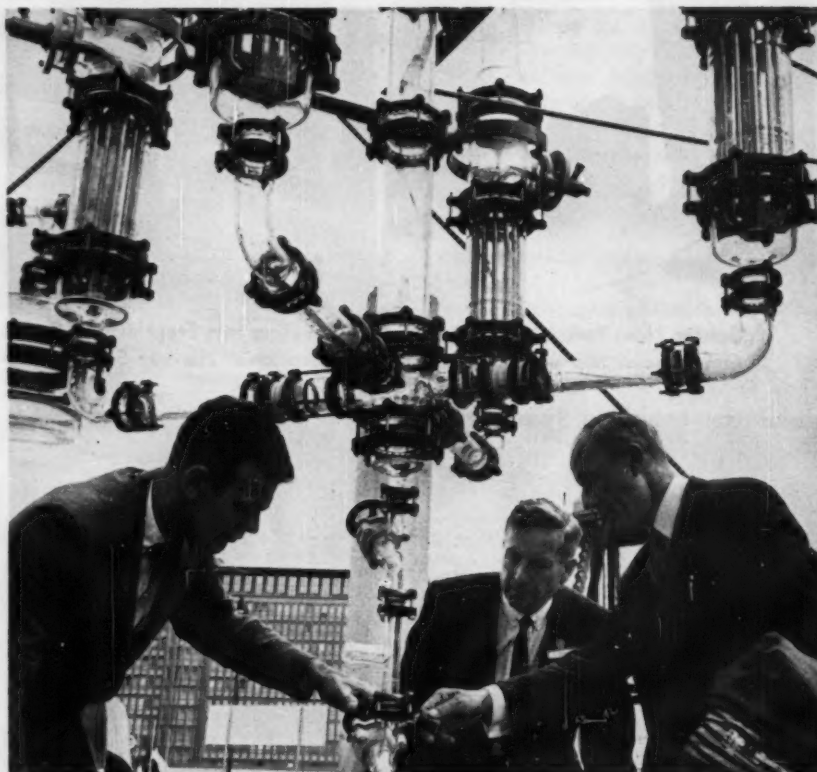
European business trips are not without their moments of relaxation and charm, however. And, Mark admits that he has the foreign-travel "bug" which he hopes he can transmit to Gray.

At the fair grounds in Frankfurt, he bought German newspapers from a blonde fraulein news dealer, introduced Gray to eating Frankfurt-style frankfurters—a balancing act not easily mastered. The frankfurter is large, the bun is small and the mustard is hot.

Mark savors, Gray fumbles Frankfurt-style hot dogs at refreshment stand.



At Achema entrance gate, Mark shows his delegate's ticket to uniformed guard. Shortly before he received ticket, show information at reception hall.



Mark and Gray scrutinize exhibit of giant maze of glass process equipment made of Jenaer Glass produced by West German manufacturer Schott.





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They come in a variety of sizes and types—from little ones that tenderly tote tomatoes to big roughnecks that haul iron ore for miles. But, tough or gentle, the common denominator of most conveyor belts is their attractiveness to fungi. *Scientific Chemicals'* fungicides, added to these belts greatly improve durability—protecting both the base fabric and the coating against mildew attack. *Scientific Chemicals'* formulations are custom-compounded to solve individual and specific problems. So, whether you want to add a biocide to the rubber recipe, incorporate it into the latex binder, or treat the base fabric—or do all three—*Scientific Chemicals* can help you do the job.

SHOULD WATER BE KEPT INSIDE OR OUTSIDE?

Well, that depends . . . most folks agree it's best *inside* a fire hose—and *outside* a convertible. But often it's difficult to keep water where it belongs, because wherever fabric comes in contact with water—as it must in fire hose, awnings, tents, tarps, etc.—there's a danger of mildew and subsequent rot. *Scientific Chemicals* has developed a fungicide that is both odorless and safe and greatly extends the service life of such products. If your fabric products have been suffering at the point of sale because competition has introduced a longer-lasting material, wouldn't it pay you to

investigate this inexpensive method of regaining your value leadership?

"A ROSE BY ANY OTHER NAME WOULD SMELL AS SWEET"

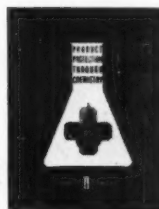
But what about your product? Many products packed in containers are attacked by microbes. And when the container is opened they, well . . . er . . . smell. Adhesives, PVA's, and resin emulsions are a few of the victims. Such products can be made socially acceptable (and saleable) with SC microbe killers, and some have been used safely and effectively in milk carton adhesives for years. You can make your product unpalatable to microbe intruders—and more acceptable to your own customers with *Scientific Chemicals'* formulations.

NOW—YOU TELL US, PLEASE

In this small space we can give you only a glimpse of our accomplishments and potentialities, and merely suggest your opportunity to improve your sales with SC products. As a rule, *WE* must know what *YOU* need before we can provide the answer. And so we have prepared an interesting new booklet that may start your ideas going. It describes some of the hampering circumstances we've eliminated and product betterments we've provided for our customers. The booklet belongs in your hands now. We'll be most happy to put it there.

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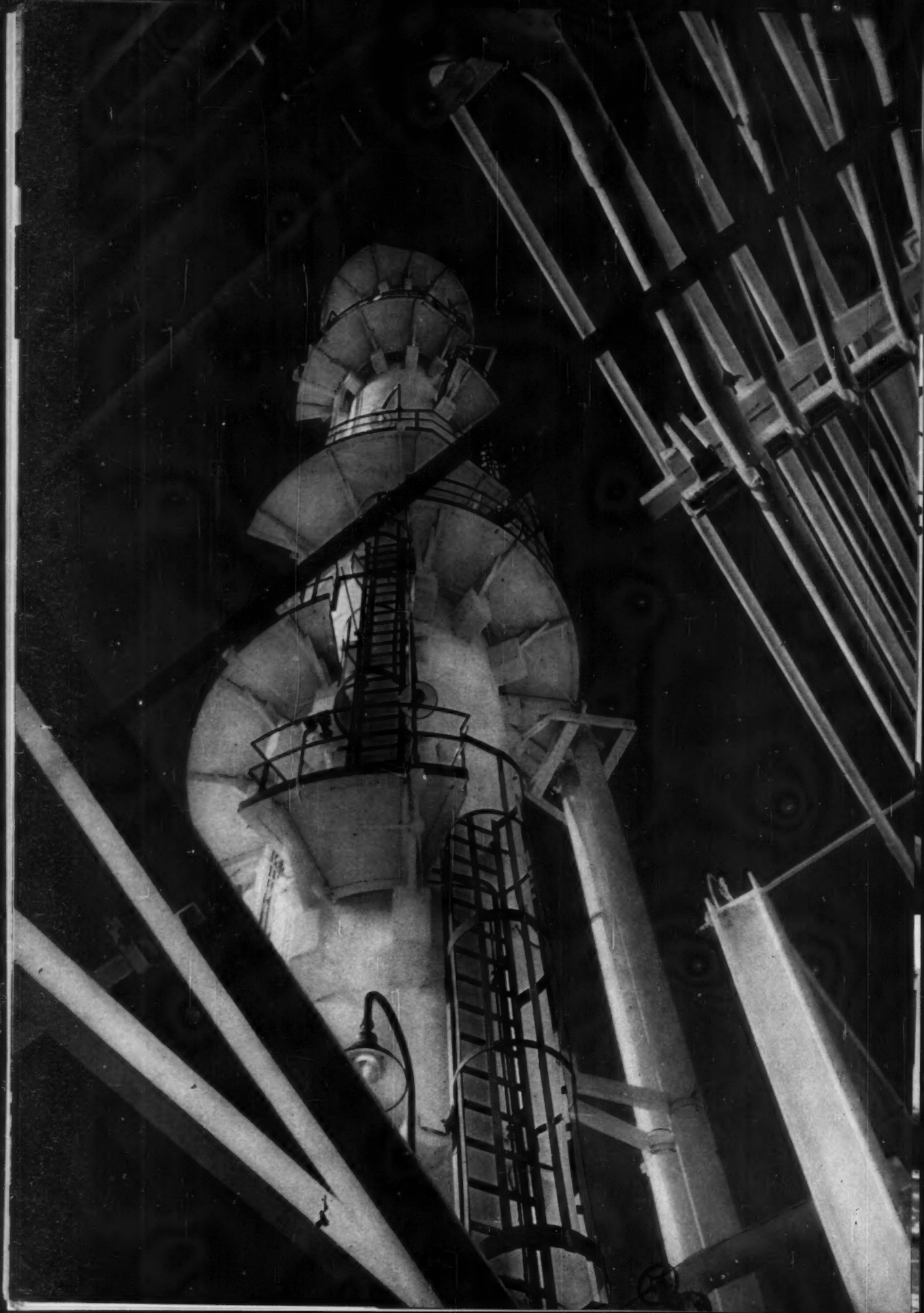


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SAMPLE FROM PIPELINE:	1st Week	2nd Week	3rd Week	4th Week	5th Week
Inspection:					
Ethylene: Mol %	100.0	100.0	99.9	100.0	99.9
Methane: Mol %	Nil	Nil	Nil	Nil	Nil
Ethane: Mol %	Nil	Nil	0.1	Nil	0.1
Propylene and Heavier: PPM by Volume	69	Trace	73	38	65
Acetylene: PPM by Weight	4	4	2	2	2
Sulfur: PPM by Weight	5	5	4	3	< 1
Water: PPM by Weight	< 1	< 1	< 1	< 1	< 1
Oxygen: PPM by Weight	< 1	< 1	< 1	< 1	< 1
Carbon Monoxide: PPM by Volume	5	5	5	5	5
Carbon Dioxide: PPM by Volume	< 10	< 10	< 10	10	19
Hydrogen: PPM by Weight	< 1	< 1	< 1	< 1	< 1

PETROCHEMICALS DEPARTMENT, GULF OIL CORPORATION, PITTSBURGH, PENNSYLVANIA

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Emersol 132 Lily Stearic Acid	3/0.3	1/0.3	12.5/2.3	4/1.8
Emersol 120 Stearic Acid	5.5/0.4	1.5/0.4	22/2.6	7/2



FATTY ACID DIVISION

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Market Newsletter

CHEMICAL WEEK

June 24, 1961

Sluggish polyvinyl chloride markets last week brought down the price of vinyl chloride monomer another 1¢/lb. It emphasizes the impact of competition in the polyvinyl chloride resin market in face of an estimated 35% overcapacity.

The monomer cut—of uncertain origin—met with no noticeable opposition and brought the tab down to 7.5¢/lb., a substantial reduction from the 11¢ or more asked only six months ago.

Setting the stage for monomer cuts has been the decline of PVC resin prices to 17.5¢/lb. or less from as much as 25¢/lb. last year. Although the industry doesn't discount the possibility of pressure for tariff protection of PVC products if business continues to flounder (*CW Market Newsletter, June 3*), there is still hope that the downtrend will show signs of a change in the second half of '61.

Meanwhile, vinyl chloride prices are expected to drop another notch. The reduced monomer price may drag down PVC cost, once again putting the squeeze on small producers. Probable result: New demands for lower monomer tabs. The big question: Where is the price bottom?

•

Dow Chemical last week escalated price of styrene monomer to a flat 11¢/lb. for rubber-grade material. But the increase—amounting to a meager 0.01¢/lb.—indicates no real strengthening of styrene demand.

The general 10% price reductions initiated earlier this year by Koppers Co. (*CW Market Newsletter, March 11*) remain essentially intact. Polymer-grade styrene also stays at the reduced 13¢/lb. level; it was 14.5¢ before the general reduction.

•

Meanwhile, styrene capacity continues to expand at a rapid pace. Cosden Petroleum is now onstream at Big Spring, Tex., with two new units that triple the firm's styrene capacity to more than 60 million lbs./year.

And the Sinclair-Koppers joint venture in Texas—a 70-million-lbs./year monomer plant—is expected to be completed late this summer. Koppers will market the monomer output.

Ethylbenzene for the Sinclair-Koppers unit will come from the aromatic stream of Sinclair's Houston refinery. Cosden's monomer unit includes facilities for making ethylbenzene by catalytic alkylation of benzene with ethylene. The additional units are required because the ethylbenzene available at Cosden's Big Spring refinery is already recovered and converted into styrene in the company's original 20-million-lbs./year monomer plant.

Market Newsletter

(Continued)

Du Pont initiated a 1¢/lb. price reduction on hydrogen cyanide, bringing tank-car cost down to 13¢/lb. American Cyanamid and Monsanto promptly reported they would post competitive prices.

At the same time Du Pont touted the economic advantages of using hydrogen Cyanide in preference to sodium cyanide. For example, 18.3¢/lb. sodium cyanide (delivered) yields cyanide at 34.5¢/lb., whereas hydrogen cyanide at 13¢/lb. (plus 1.5¢ freight) gives cyanide at 15.1¢/lb. That's a saving of 19.4¢/lb.

Similarly, Du Pont figures it's cheaper to make sodium cyanide from HCN and caustic than to buy sodium cyanide. Sodium cyanide costs 18.3¢/lb.; HCN at 13¢/lb. (plus 1.5¢/lb. freight) treated with caustic at 3.8¢/lb. comes to 11.1¢/lb. of sodium cyanide—in this case representing a saving of 7.2¢/lb.

Why use sodium cyanide at all? These comparisons are for integrated "in process" applications; small-volume users of HCN can't afford capital investments for necessary refrigeration and handling equipment.

•
In response to recent "weaknesses" in acetone pricing, Hercules Powder has officially dropped its tab 1¢/lb. across the board. New base: 7¢/lb. in tank cars, delivered.

•
Most West Coast ammonia producers are cheered by the price hike to \$74/ton (effective Aug. 1), posted by price leader Shell Chemical.

Ammonia has long been considered underpriced at \$66/ton. Past efforts by Hercules, Collier and Valley Nitrogen to boost tabs have failed; in fact these firms have been keeping varying higher lists quotes—Collier at a high of \$92/ton (*CW*, Aug. 6, '60 p. 58)—while meeting competition at the going \$66/ton figure (they may now keep previous quotes but sell at the new Shell price.)

Other ammonia marketers—Best Fertilizer and Ortho Division of California Chemical, for example—say the boost is long overdue, hence are expected to follow suit with similar increases.

•
Most chemical processors have weathered the maritime strike well. Hardest hit so far have been oil refineries—dependent on tanker movements—and several have been forced to shut down. Petrochemical output is expected to be affected next unless the strike is settled soon. Reasons why the dispute hasn't had an even harder impact on the CPI: numerous independent union contracts, and early rerouting of outbound movements to foreign-flag vessels. But if the walkout continues, look for tight supplies of petroleum products, disruption on the inland waterways.

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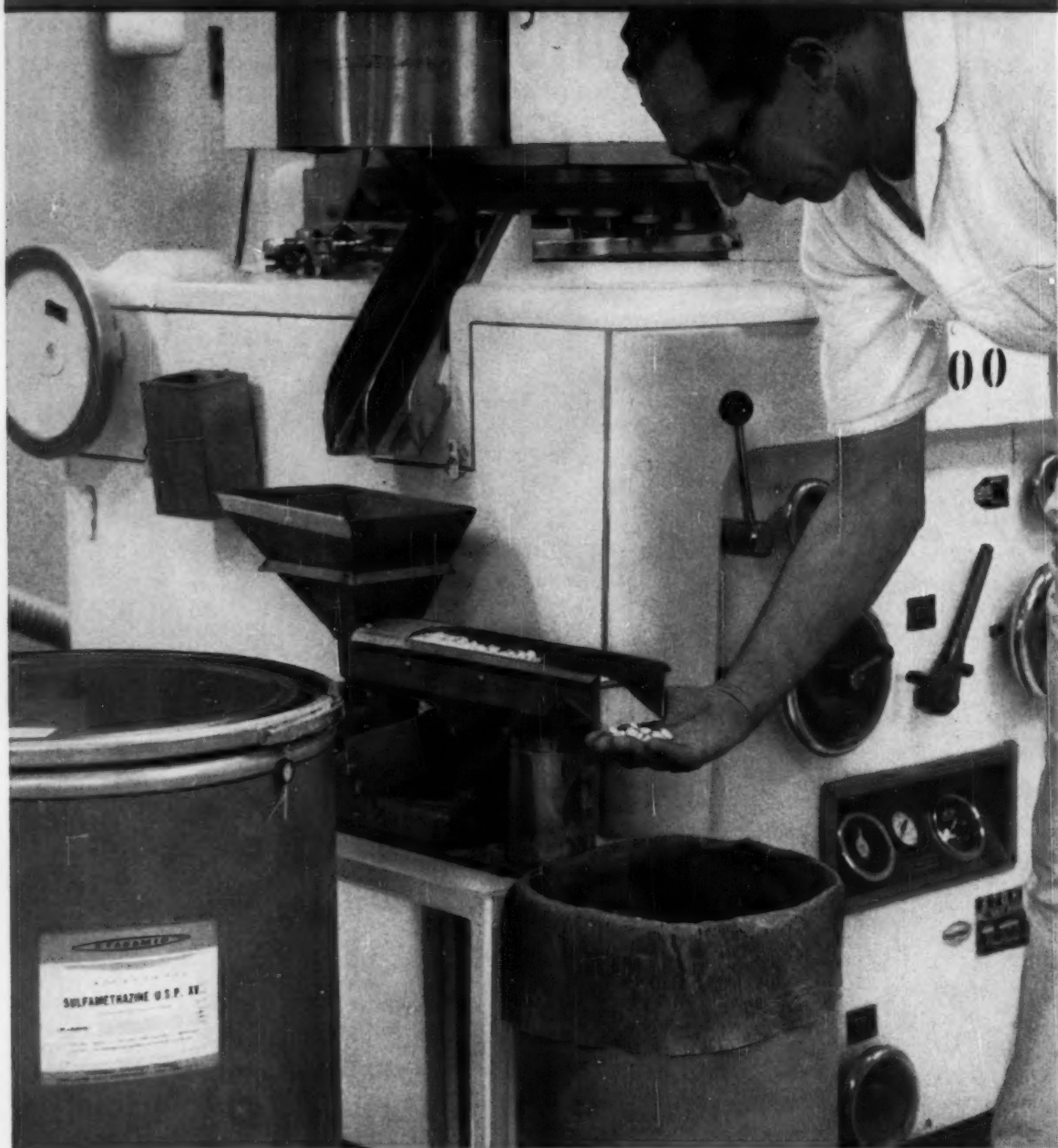


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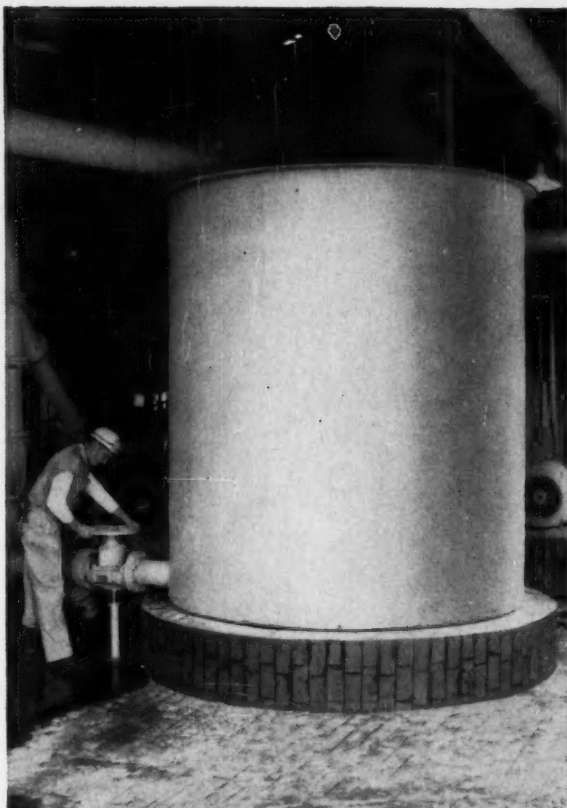
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Chemical Newsfront



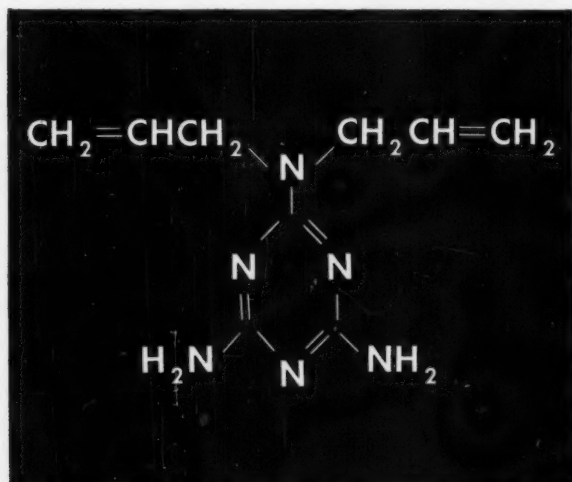
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(Plastics and Resins Division)

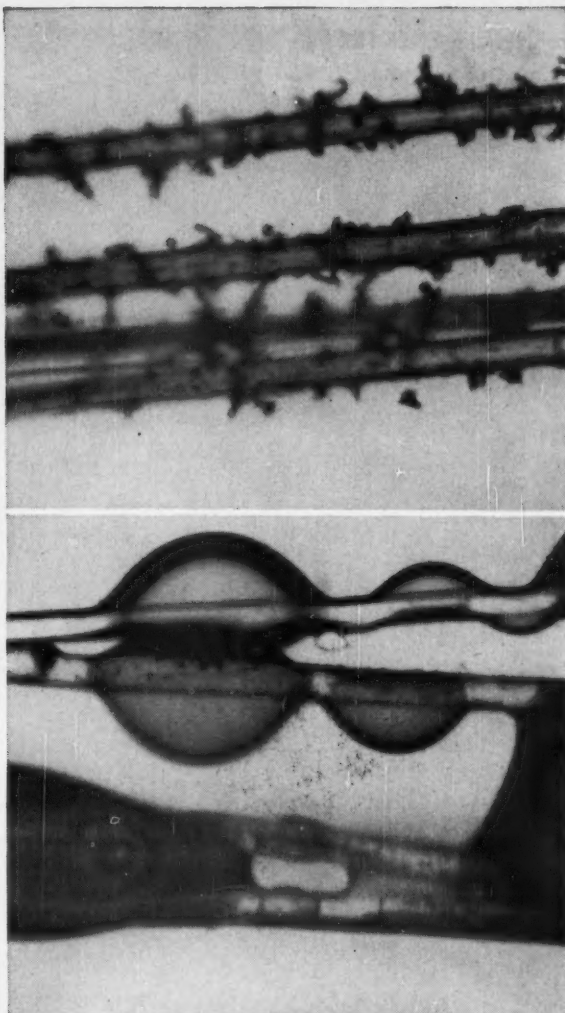


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(Dyes Department)

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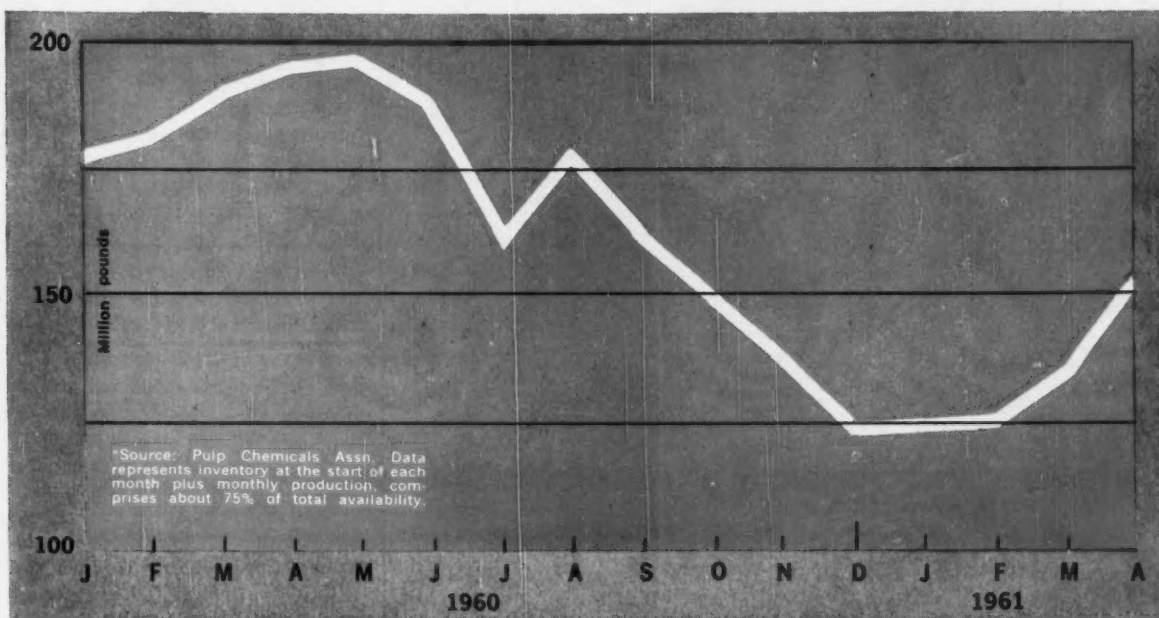
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Dip in crude tall oil output* puts pinch in fatty acid supply



Tall Oil Dip Squeezes Fatty Acids

Last month, tall oil fatty acid prices were hiked 1¢/lb. across the board. And this week Hercules revealed its new price schedule, effective July 1, calling for an additional 1¢/lb. increase. These two price advances reflect the extremely tight supply of tall oil fatty acids—a tightness that will probably persist for the remainder of '61.

In fact, these organic acids, in ample supply only six months ago, are now on allocation by each of the producers. Contributing to the tightness of supply are these four major factors:

(1) The sharp drop in crude tall oil output during the latter part of '60 (see chart above). Crude whole tall oil is a by-product of kraft pulp production (via the sulfate process). The fatty acids are obtained by fractionating the crude whole tall oil. When kraft pulp output hit the skids in '60, the production of tall oil also slumped sharply. Although production of kraft pulp has picked up considerably since the start of the year, output is still well below that of last year's comparable period.

(2) The steadily rising prices of tallow, soybean oil and other vegetable oils—all of which compete with tall fatty acids. Result: increased demand for the latter.

(3) Rising export demand.

(4) Mounting demand for tall oil fatty acids as a chemical raw material.

Meanwhile, demand for the acids has been growing rapidly. In '50, domestic and export demand was only 5 million lbs. This figure reached 112 million lbs. in '58 and hit a record high of 172 million lbs. in '60.

Tall oil production is expected to increase for at least the next six months so that by year's end the availability of crude tall oil—and thus tall oil fatty acids—will reach last year's level. But because of the factors cited above it won't be enough to meet total industry requirements.

Finding a Market: Alkyd resin production for protective coatings represents one of the major end uses for tall oil fatty acids. During '59 and '60 approximately 40 million lbs./year went into these applications. But in '61 a considerable pick-up in demand has taken place and alkyd producers are

clamoring for more. Main reason: steadily rising price of soybean oil—a competitive product in alkyd production.

In February of '60, soybean oil (crude, Decatur) sold for 7.6¢/lb. The price had risen to 9¢/lb. by July, to 10¢/lb. by year's end, and 13¢/lb. by March '61. Currently the price stands at about 12¢/lb. By comparison tall oil fatty acids average 6-8¢/lb.

Soybean oil prices for the '60-'61 marketing year will average about 12¢/lb., up 45% from the '59-'60 average of 8.3¢/lb., according to the U.S. Dept. of Agriculture. Consequently, the demand for tall oil fatty acids in alkyds should remain strong for the remainder of this year.

Demand for tall oil fatty acids in soaps, detergents and disinfectants has also picked up sharply since the start of '61, due to rising tallow and vegetable oil prices. In '60 the average tallow price was 5.5¢/lb. but by March of this year the price had risen to 7¢/lb.

By year's end, according to the USDA prices will probably hit

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SINDAR® Corporation

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MARKETS

Tall Oil Fatty Acid End-Uses

(Million pounds)	'59	'60
Protective coatings	40	41
Soaps, detergents, disinfectants	30	25
Intermediate chemicals	32	43
Flotation	9	7
Tallate driers	3	2
Other	23	28

Totals 137 146

Source: Pulp Chemicals Assn.; estimates for '60 are preliminary.

7.5¢/lb. This high tab is due to limited supplies in face of climbing demand: output won't go much above the '60 level, but export demand is rising and seems likely to continue to do so—as are soap and detergent requirements. This year's strong demand by syndet makers is in contrast to their situation in '60, when they bought some 5 million lbs. less (25 million lbs., all told) than they had in '59.

Intermediate Step-Up: A significant trend of the past several years has been the growing importance of tall fatty acids as chemical intermediates. In '60, manufacture of various chemicals (excluding alkyds, soaps, detergents) took about 43 million lbs. of tall fatty acids—roughly 11 million lbs. over the '59 consumption level. It was the largest single gain in any of the tall oil fatty acid market segments.

Both immediate and long-term growth is expected here. Some of the most important processes involving tall fatty acids include epoxidation, dimerization, sulfonation and amidation.

Growth in this market is particularly gratifying to the tall oil producers, since these uses help stabilize the tall fatty acid growth pattern. The other major end uses are all largely dependent on the erratic prices of commodities such as tallow, soybean oil and other vegetable oils.

Exports Double: In '60, exports of tall fatty acids hit 26.5 million lbs.—more than double the '59 export mark of 12.5 million lbs., and five times the '58 level. According to industry sources, export needs will remain strong for the short-range future, at

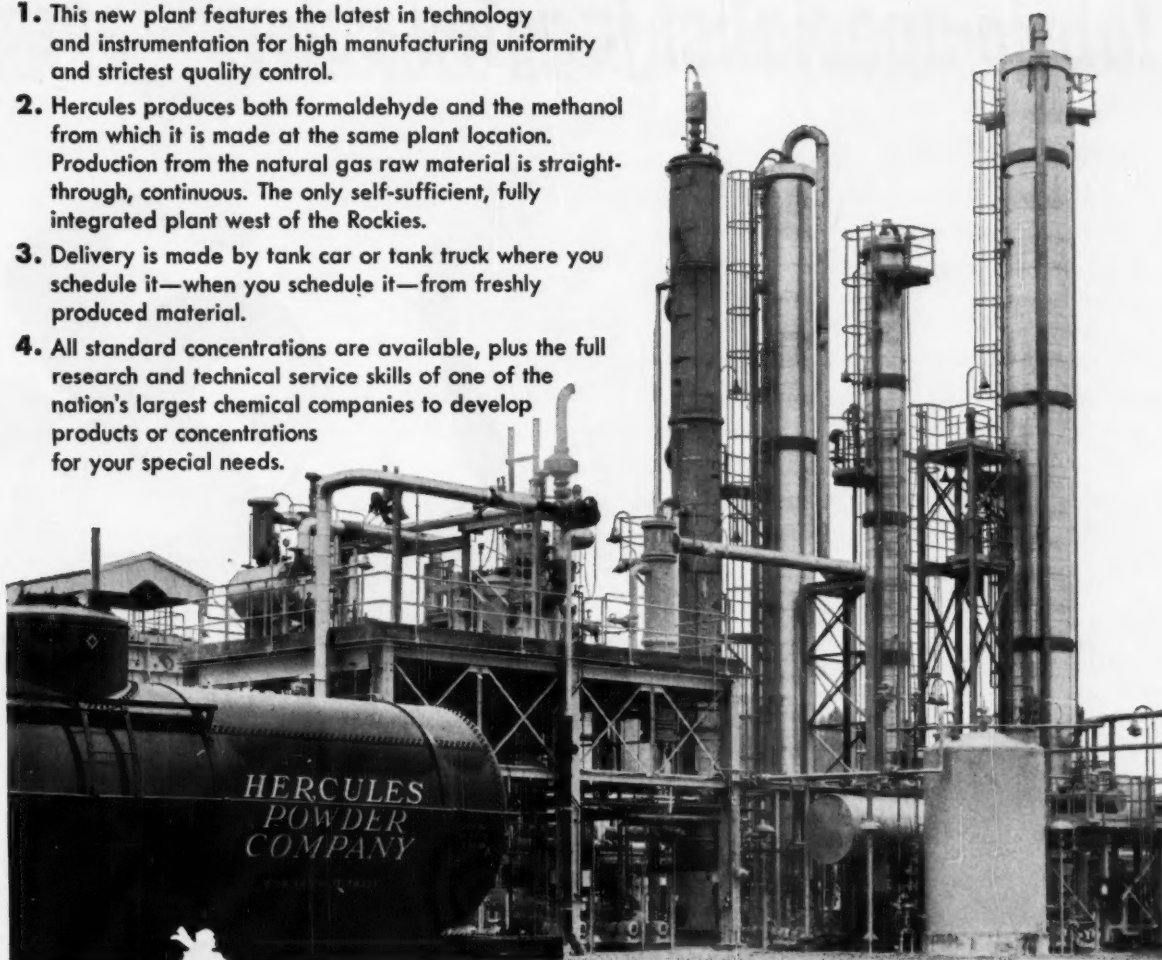
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June 24, 1961 CHEMICAL WEEK 153

fabric specialist juggles colors—even





black without color contamination

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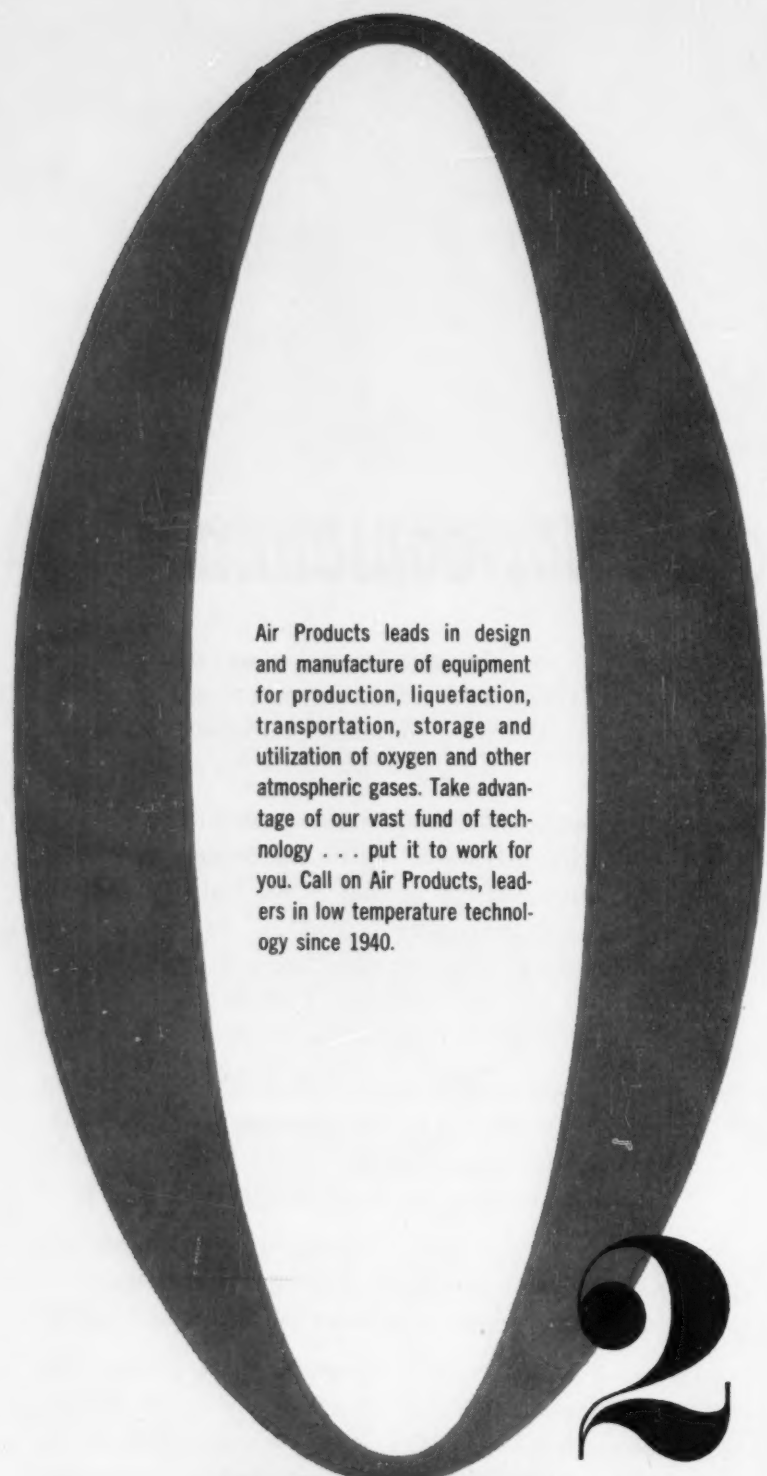
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MARKETS

U.S. Tall Oil Fractionating Capacity

(Million lbs./year crude tall-oil input)

Arizona Chemical	220
Bell & Gossett	20
Crosby Chemicals	120
Glidden	48
Hercules Chemical	220
Monsanto-Emery	80
Heyden Newport	130
Union Bag-Camp Paper	150
W. Virginia Pulp & Paper	32

Total 1020

least. Especially in demand are the top-quality acids, suitable for alkyd and detergent use, which are not manufactured outside the U.S. or Canada.

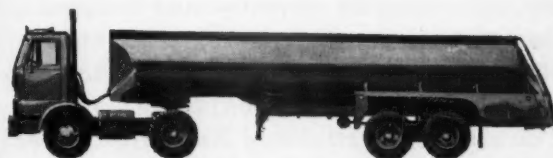
U.S. tall oil fractionating capacity now stands at 1.02 billion lbs./year (calculated on crude tall oil input) and fatty acid output potential is about 300 million lbs. Nine U.S. companies make up the list of fractionators (*see table above*), with Hercules and Arizona Chemical largest producers. Each can fractionate an estimated 220 million lbs./year of the crude oil.

The other producers are the following: Union Bag-Camp Paper; Heyden Newport; Crosby Chemical; Monsanto-Emery; Glidden, West Virginia Pulp and Paper, and Bell & Gossett.

Since '60, four of these companies Arizona Chemical, Hercules, Heyden Newport and Union Bag-Camp Paper—expanded their facilities. The total capacity buildup amounted to over 250-million lbs. (calculated on a crude tall oil input basis).

The irony of the current dilemma is that U.S. producers boosted fractionating capacity over 30% during the last 12 months to take care of an expected rise in demand. Now, with ample capacity, they are still unable to fill their customers' needs, because of inadequate raw material supplies.

Industry opinion, however, is that although the raw material supplies will be limited for the rest of '61, they will become more plentiful when kraft paper output takes its expected climb. And when that time comes, tall oil fatty acids will be substantially eased.



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What are your methylamine needs—small quantities for development work, or large shipments for production? In either case, Rohm & Haas provides service that fits your needs best... for mono-, di-, or trimethylamine; anhydrous or aqueous form.

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Rohm & Haas recently introduced the 590-pound capacity cylinder to provide an economical and convenient intermediate quantity of anhydrous methylamines, between conventional size cylinders and

tanktrucks or tankcars. The new 590-pound cylinder offers savings of over 20% in tare-weight freight cost, when compared with 100-pound cylinders.

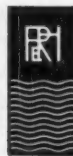
There are also freight savings for bulk-quantity users of aqueous amines, since higher concentrations in two grades are now available for bulk shipment: Monomethylamine is offered in 50% as well as 40% solution; dimethylamine, in 60% as well as 40%.

Availability from two plant locations assures you dependable supply. In addition, Rohm & Haas draws upon 27 years of commercial production experience to offer sound technical service on design of unloading, storage and handling facilities.



Write to Dept. SP-8 for free copies of 3 technical booklets: Methylamine Chemistry and Uses, Storage and Handling, Properties and Analytical Methods. Methylamine samples are available upon request.

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Features

New Source of High-purity Tributoxyethyl Phosphate

A new unit of Stauffer's Anderson Chemical Division at Weston, Mich., is now producing tributoxyethyl phosphate. A new process is now producing this and other trialkyl phosphates at exceptional levels of purity.

Tributoxyethyl phosphate is used in many polystyrene, polyacrylate and styrene acrylic co-polymer formulations. As a plasticizer it improves levelling and spread. In floor-wax compounds it co-plasticizes with tributyl phosphate or phthalates to add to compatibility of carnauba wax and shellac-polystyrene compositions.

In chlorinated rubbers and nitrile recipes tributoxyethyl phosphate is a softener and imparts exceptional low-temperature flexibility and resilience. Compression set and flammability are also lowered. It is recommended for seals, gaskets, hose, shoe soles and similar applications.

Warehouse stocks are currently maintained at Weston, Mich., Vernon, Calif., and Chauncey, N. Y.

We shall be glad to send samples on request to Anderson Chemical Division, Stauffer Chemical Company, Weston, Michigan.

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HAVE YOU NOTICED THE TREND TO POLYURETHANE?

Hewitt-Robins did! A few years ago this company became a major producer of latex rubber foam cushioning. Later, management discerned the tremendous possibilities of polyurethane foam. Following this came the recent association of Hewitt-Robins' polyurethane foam division with Stauffer Chemical Company as Stauffer-Hewitt, Inc., at Franklin, N. J. Stauffer is a supplier of polymerization catalysts and over-all chemical know-how.

New developments in the polyurethane field come at a startling pace. Use the coupon for further information that may help your business.

Do you use Aluminum Sulfate ?



Hot off the press is "Aluminum Sulfate", a 44-page authoritative treatise on this basic chemical.

The new Stauffer volume carries conventional information on specifications, storage and handling, analysis, etc. In addition there are many tables, graphs and nomographs for technical reference and application to daily problems in the use of aluminum sulfate.

Included with the book are the Federal Specification and AWWA Standard for Aluminum Sulfate. Copies of "Aluminum Sulfate" will be supplied on request. Please use the coupon at right.

STAUFFER OFFICER SPEAKS IN FRANCE

Christian de Guigné, Chairman of the Board of Stauffer Chemical Company spoke in Paris on June 8 at the meeting of the Société de Chimie Industrielle. He talked of recent developments in the chemical industry in the United States and their meaning to the overall significance of chemistry as a force for international progress. Mr. de Guigné delivered his address in French.

Stauffer Appoints Esco

Esco Corporation, has been appointed distributor for Stauffer's plastic pipe in the eleven western states, Texas, Alaska and Hawaii. The pipe is produced by Stauffer's Molded Products division at Vernon (Los Angeles), Calif. Products include normal and high-impact PVC, semi-rigid styrene copolymer (ABS) and flexible polyethylene pipe for hoses and the like.



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More work for more people in a wee town in Tennessee

Stauffer's new plant for the production of liquid aluminum sulfate is now in operation in Counce, Tennessee. Counce—pronounced "koonts"—is on the southern border of Tennessee close to the Mississippi line. The country thereabouts is heavily forested and produces tremendous amounts of wood suitable for the manufacture of paper.

Tennessee Pulp & Paper Company has a big plant at Counce—Koonts, remember?—and needs aluminum sulfate. This simple but useful chemical sets the size on paper so it comes out suitable for writing or printing.

Anyway, if you're panting for aluminum sulfate, Stauffer makes it at three places in Louisiana, two in Texas, two in California, one each in Oregon and Washington as well as Counce.



STAUFFER EXPANDS IN FLUORIDES

Stauffer has long been a big producer of hydrofluoric acid, soda ash and boron compounds, all essential to the growing field of fluoride and fluoborate compounds. Stauffer's activity in this field is now broadened by acquisition of the fluoride production facilities of Aluminum Company of America at East St. Louis, Illinois. No policy changes are contemplated and there will be no interruption of supply or service to present Alcoa customers.

Fluorides produced at the plant include sodium fluoride, sodium bifluoride, fluoboric acid and sodium fluoborate. The products are variously used in ceramics, fluxes, water fluoridation, preservatives, metallurgy, electro-tinning, electroplating, fluxes for soldering, welding and brazing, and in laundry soaps.

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Victor Stabilized T 80 Methyl Parathion Gives Broad Protection

You name it—from A to almost Z (alfalfa to wheat)—and Stauffer's Victor Chemical Works Division has a new stabilized methyl parathion which protects this wide range of vegetable growth against insects which also run nearly from A to Z. The new Victor product is "Stabilized T 80 Methyl Parathion," available at all regular methyl parathion stock points.

Aside from what this highly effective insecticide does for crops it offers numerous advantages to formulators. Because of its 80% concentration of unpronounceable phosphates and solvents, less material is needed to saturate the carriers. This yields a drier, freer-flowing dust base; cuts spray time and labor cost for the grower.



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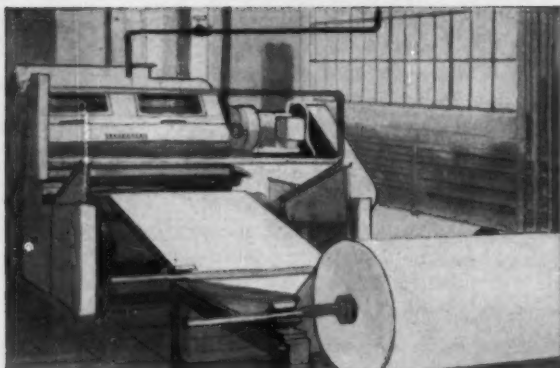
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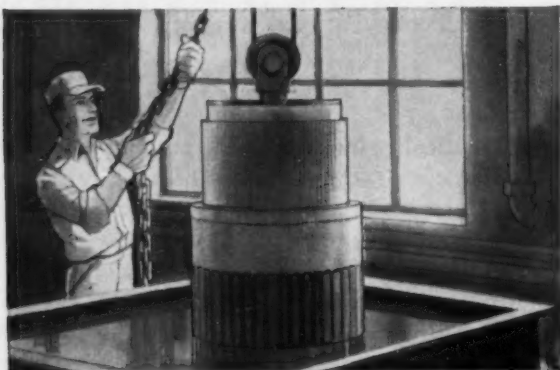
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Chlorinated Cyanurates: Payoff Time Near?

After seven years of aggressive development efforts, makers of chlorinated cyanuric acids are now expecting the payoff, a sevenfold market expansion—to 40 million lbs./year—in the next few years. All of the major applications are expected to take part in bolstering demand by '65 far beyond existing 14-million-lbs./year capacity. Result: a scramble by current producers to construct new facilities and possible entry of additional companies.

Although available since '53, cyanurates reached a sales level of about 6 million lbs. only last year. Almost all this went into chemical specialties—the cyanurates provide a safe, ready supply of free chlorine that puts the whitening or sanitizing kick into laundry bleaches, germicides, and the like. Four members are now commercial—trichloroisocyanuric acid (85% available chlorine by weight) dichloroisocyanuric acid (70% chlorine); sodium dichloroisocyanurate (60%); potassium dichloroisocyanurate (59%). All are priced at 65¢/lb. in carloads; choice depends on use.

Cyanurate makers have had a long, and slow job convincing specialties makers that their products do the job promised and that there is a good market potential for items made with them. They feel it's up to the specialties makers to develop the markets, and there's full confidence now that this can be done.

Hope at Home: The largest potential and the biggest hope of the producers is the household bleach market. Total market potential here is said to be 200 million lbs. of chlorinated cyanuric acid. In '60, however, only about 2 million lbs. of these chlorinated organic compounds were sold for this use.

During the past five years the total market for household dry bleaches has increased over 50% (retail value has climbed from about \$9 million in '55 to over \$14 million in '60). The market share represented by chlorinated cyanuric acid types registered the largest gains in this time. They were virtually unavailable in '55 and now they take about 40% of the total dry bleach market.

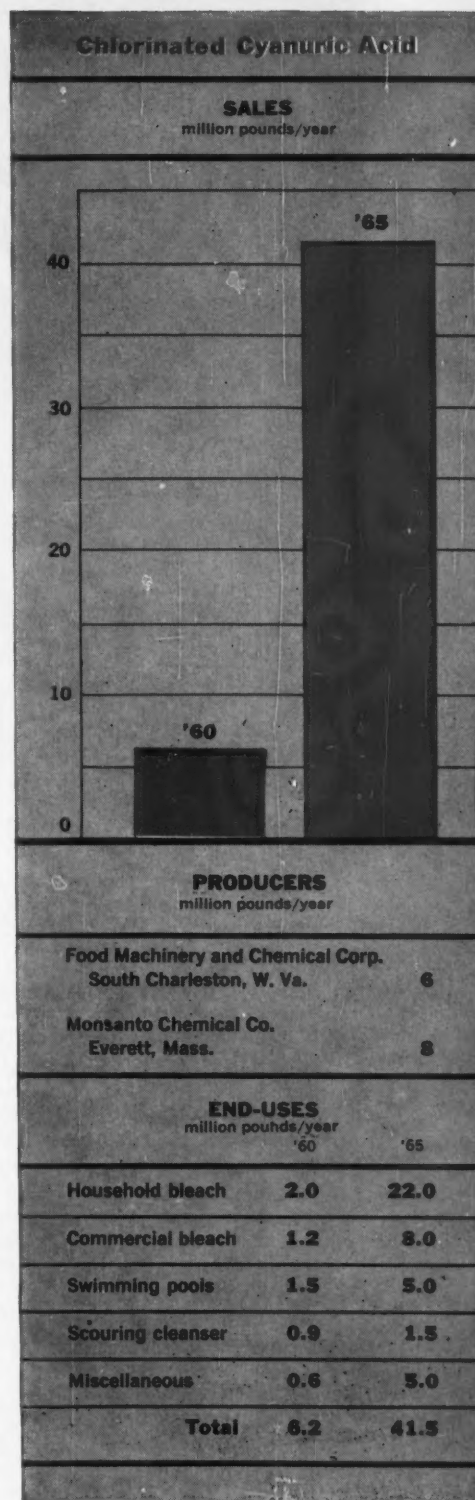
However, only a handful of household dry bleaches based on cyanuric acid are being marketed, and only one, Purex's Beads of Bleach, is marketed nationally.

Most encouraging to cyanurate producers is that all of the "Big Three" soapers, Procter & Gamble, Colgate and Lever, are reported to be actively researching chlorinated dry bleaches; but they have not yet test-marketed a dry bleach. There is good reason to believe that at least one of these companies will introduce a dry bleach based on chlorinated cyanuric acid (other organic chlorine compounds so used have not worked out successfully) within the next 12 months. If one of these companies does launch such a dry bleach—and this has been predicted several times—its marketing know-how and advertising dollars will be the most important single influence on the demand for chlorinated cyanuric acid.

By '65 the two current producers, Food Machinery and Chemical and Monsanto, optimistically see the household dry bleach market for chlorinated cyanuric acid at about 22 million lbs. Even this growth will have to be made in the face of severe competition from the oxygen-type bleaching compounds—e.g., the perborates and persulfates. This month, for instance, Du Pont has begun test-marketing a dry bleach called Trey, based on a monopersulfate salt, and Lestoil's Lestair, also made with a persulfate, has proved quite popular.

Cleanup Aids: Makers of chlorinated cyanuric acids are also counting on growth in other end-use areas, areas that in '60 took about 4.2 million lbs. These include products such as swimming pool additives, commercial bleaches, scouring cleansers, dishwashing formulations and sanitizing compounds. Requirements for these uses are expected to grow to a total of about 19 million lbs. by '65, with swimming pool additives and commercial bleach applications taking the big share.

Only a little over 1 million lbs. of the chlorinated cyanurics went into industrial laundry applications in '60. However, dry bleaches in general and



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MARKETS

the cyanuric acid variety specifically, are reportedly gaining a foothold in the institutional and linen supply markets.

By '65, the manufacture of commercial bleaches may take at least 8 million lbs./year of cyanurics. But this segment could grow much more rapidly if it can be proved that cyanuric-based bleaches are more gentle to fabrics than conventional liquid hypochlorite bleaches.

Quadrupled Markets: Swimming pool sanitation is another market getting a great deal of attention. Only about 1.5 million lbs. of cyanurics were used in swimming pools in '60. But this market seems likely to grow rapidly during the next five years; predicted annual demand level by '65: about 5 million lbs.

Other uses—e.g., cleaners, dishwashing compounds and detergent sanitizers—took about 1.5 million lbs. of cyanurates in '60. Demand in these applications is slated to grow to about 6.5 million lbs./year by '65.

Producers: Only two companies, Monsanto Chemical and FMC Corp., now are producing the four chlorinated cyanuric acid compounds.

These firms' combined capacity is estimated to be about 14 million lbs./year. Monsanto has an 8-million-lbs./year plant at Everett, Mass.; FMC has a 6-million-lbs./year unit at South Charleston, W. Va.

Although demand for these chlorinated organic compounds is expected to pass 40 million lbs./year by '65, no shortage is predicted. Both Monsanto and FMC are able to expand rapidly.

And, in addition, Allied and Olin Mathieson are reportedly eyeing the situation, may decide to start production soon.

The market development of the chlorinated cyanuric acids was spearheaded by Monsanto. It built a pilot plant in '53, but it wasn't until '57 that its commercial unit was put into operation. FMC was quick to follow, first with a pilot plant at Baltimore, Md., then with its commercial unit at South Charleston.

Now, the long-envisioned markets for the cyanurates are beginning to open. If the specialties makers can successfully promote the products based on them, the prediction of markets of 40-million lbs./year may prove conservative.

U.S.I. CHEMICAL NEWS

June

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

1961

NH₃ and H₂ are Keys to New Chemical Process For Refining Copper Ore

A low-capacity (42 tons/day), low-investment plant for refining copper ore by chemical means is now under construction in the Philippine Islands. The plant will employ a new, all-chemical process to convert low-grade ores to high-grade (99.95% pure) metal. It will eliminate expensive smelting and refining procedures. Air and stream pollution is expected to be negligible.

In the process, the ore—concentrated by the usual crushing and flotation methods—is subjected to an ammonia leach under 125 psi pressure. Copper and zinc dissolve. Sulfur and iron are removed as a residue. The copper-zinc solution is distilled, and excess ammonia recovered in this step is recycled. The solution of metals goes through oxydrolisis to reduction with hydrogen. Pure copper powder results, which is compacted into wire or sheet. All sulfur is converted to ammonium sulfate for use as fertilizer.

The process is said to be easy to control, to require little electric power, and to be low in operating cost.

Ether to Meet New, Tighter ACS Specs Being Produced by New U.S.I. Refining Unit

New Unit at Tuscola, Ill. Increases Versatility of U.S.I. Ether Facilities

A new ethyl ether unit has just gone on stream at U.S.I.'s alcohol-ether plant in Tuscola, Illinois. Ether processed through the refining unit meets the new, more stringent specifications recently published by the American Chemical Society. In addition to requiring freedom from foreign odor, the new specifications for ethyl ether, ACS absolute, contain these tighter requirements:

- lower peroxide content (as H₂O₂) from 0.001% maximum to 0.0001% maximum.
- specifies aldehyde content (as H₂CO) as 0.0005% maximum, rather than "to pass test".
- lower water content from 0.05% maximum to 0.01% maximum.

All other specifications for absolute ether have remained unchanged. These include density, acidity, non-volatile matter, alcohol content, and substances darkened by sulfuric acid.

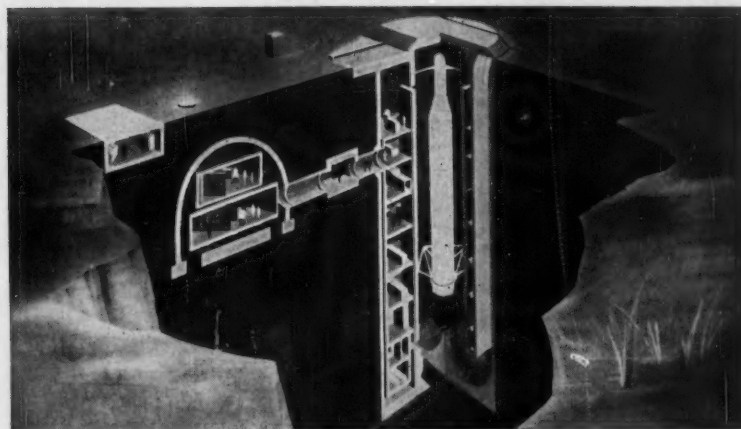
Cesium Is Propellant In Prototype Ion Engine

A small model of an ion propulsion engine employing cesium as the propellant is nearly ready to fly, according to a recent article on electrical propulsion engines for spaceships. The prototype, developed for the Air Force, produces a thrust in the range of several ten-thousandths of a pound.

The ion propulsion, or electrostatic engine accelerates a beam of positive cesium ions by means of an electrostatic

MORE

DIMAZINE® (UDMH) Plant Expanded To Supply More Fuel for Titan II



Artist's cutaway conception of a typical TITAN underground launch site. Use of storable liquid propellants permits missile to be kept fully fueled—ready for launch directly from silo.

New facilities to produce unsymmetrical dimethylhydrazine (UDMH) for the Titan II missile have just been completed. This high-energy, storable liquid rocket fuel will help reduce the Titan II's launching time to seconds and give the U.S. an added deterrent in its defense arsenal.

The new plant, a joint venture of U.S.I. and Food Machinery and Chemical Corp. is located in Baltimore and will produce multi-million pound quantities of UDMH. This fuel is also being considered for use in other military and space vehicles in addition to its key role in the Titan program.

Copies of the complete "Reagent Chemicals" which contains these specifications and test procedures are available from the American Chemical Society, 1155 Sixteenth St., N.W., Washington, D.C.

The new refining unit is designed to produce ether that is superior for Grignard and lithium aluminum hydride reactions.

Greater Production Versatility

The new unit is another step by U.S.I. in its program to increase the versatility of its alcohol-ether production facilities. In April 1960, it was reported in the U.S.I. Chemical News that the company had added

MORE

Polyethylene Pipe Gets OK from New York City for Chemical Waste Systems

For the first time, the New York City Board of Standards and Appeals has approved polyethylene pipe and fittings for acid and chemical waste systems. The approved drainlines, made by a Rochester, N. Y. company, are now also acceptable to Buffalo, Cincinnati, Detroit, Los Angeles, the State Plumbing Code of Michigan and the Plumbers' Examining Board of Richmond, Virginia.

June

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U.S.I. CHEMICAL NEWS

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1961

CONTINUED

Ether

an ether hydration unit to the ethyl alcohol plant at Tuscola. That unit made it possible for U.S.I. to take part of its ether and convert it back to alcohol.

The company consequently has a flexible means of keeping alcohol and ether production in balance, and can better serve changing market needs without the limitations imposed by rigid manufacturing facilities.

In addition to producing ACS absolute ethyl ether, U.S.I. produces ether to meet USP specifications for institutional and laboratory use and Technical Refined ether for industrial applications.

New Polyethylene-Copper Bonding Method Gives Highest Bond Strength Yet

A new process for bonding polyethylene to copper, to alloys containing at least 85% copper, or to copper-plated metals, is reported to give bond strengths of 20 to 40 lb./in. of width. Previously-used methods are said to have given strengths of only 5 to 10 lb./in. of width.

In the new process, developed by Bell Telephone Laboratories, the metal surface is treated with a special oxidizing agent to form a cupric oxide layer. Polyethylene is then molded directly to the oxide coating, at elevated temperatures and pressures, without the use of adhesives. No treatment of any kind is applied to the polyethylene surface proper. The oxide is said to produce a high polarity at the polyethylene surface which greatly increases adhesion between metal and plastic.

Successful bonds have been achieved with copper, beryllium copper, and phosphor bronze, it is stated. The process is said to be under consideration for submarine cables, printed circuits, microwave devices and structural panels.

Have You the Latest Ethyl Alcohol Regulations?

A&TTD's latest regulations on the distribution and use of specially denatured and tax-free alcohols are now available from U.S.I. Request copies on company letterhead. Write Technical Literature Dept., U.S.I. Chemical News, 99 Park Ave., New York 16, N. Y.

Superconductor Magnet Has Core of Niobium-Tin Wire

Wire formed from an alloy of three parts niobium and one part tin has made possible the development of a superconductor magnet.

Most materials that exhibit superconductivity don't retain it in strong magnetic fields. This wire, reportedly, is capable of generating magnetic fields up to 88,000 gauss without losing its superconductivity.

The novel magnet can produce very strong fields from very small quantities of electric power. Because the wire is superconductive, power is required only to start the flow and operate the refrigeration equipment needed.

CONTINUED

Cesium

field. Cesium is the "fuel" of choice because it is easily ionized by moderate heating and offers sufficient mass to be effective.

Rocket engineers measure propellant economy in terms of specific impulse—the ratio of thrust produced to the rate of mass (fuel) consumed. Ion propulsion systems can reportedly develop specific impulses of 5,000 to 100,000, lb-sec/lb while the best chemical propellants produce a specific impulse of about 300 lb-sec/lb.

Cesium metal, 99% pure, is now available in commercial quantities from U.S.I.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Hexanitroethane, hydrazinium nitroformate, trinitromethane and similar chemicals are now being synthesized on a custom basis for holders of government research contracts on rocket propellants. **No. 1720**

A 10-stage, fully automatic glassware washer has been developed for labs, research centers, pharmaceutical houses, etc. where large quantities of glassware must be cleaned daily. Said to require an operator only part time. **No. 1721**

New 24 Kt neutral immersion gold can now be obtained. Claimed to give fast, economical deposition of thin plates of gold directly onto copper, brass, nickel, iron, lead and solder plates without use of anodes or currents. **No. 1722**

New polyethylene bottles, with unusually wide mouths to facilitate filling and dispensing, are now available in sizes from 50-2,000 cc. Come with leak-proof, tight-fitting polyethylene screw caps, scalloped for easy removal. **No. 1723**

Corrosion inhibitor to protect low make-up, closed cooling and heating systems is subject of new six-page bulletin. Said to produce protective film on all exposed metal surfaces. Compatible with alcohol and glycol antifreezes. **No. 1724**

Portable gas detector now on market is claimed accurate, sensitive. Consists of volumetric pump, detector tubes hermetically sealed in lead cylinders, remote sampling device. Detector tubes available for 36 different gases. **No. 1725**

Silicone uses in aerospace industry is subject of new brochure. Relates value of silicones in various applications to properties such as extreme heat protection, low temperature flexibility, good electrical properties, resistance to ozone, corona, weathering, thermal shock. **No. 1726**

New, magnet-actuated, miniature air switch for use in totally pneumatic circuits is described in bulletin giving specifications, features, accessories, fields of application. Recommended for explosion hazard environments. **No. 1727**

Powdered alkaline product for spray wash cleaning of steel, copper, brass, aluminum, has been introduced. Formulated for maximum detergency, minimum foaming. Inhibits steel from rusting; prevents scale formation on coils, etc. **No. 1728**

Mathematical handbook for scientists and engineers now being sold. Gives definitions, formulas, theorems, methods. Includes detailed index references and bibliographies. **No. 1729**

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**Russians bought
as well as looked
during recent big
British Trade Fair**

Red Traders: Big Buyers Out to Sell



Representatives of British chemical and equipment companies returned home from Moscow well satisfied with their sales at the British Trade Fair there earlier this month. Observers termed it the most successful commercial fair ever held in the Soviet Union. But despite the fat orders written up, there is no sign that the exhibition will result in any long-term increase of United Kingdom exports to Russia.

No matter what the long-term outlook, the exhibitors had good reason to be satisfied. During the fair's 17-day stand, more than 1.25 million Soviet citizens passed through. Many were key figures in Soviet purchasing and planning organizations.

Virtually all of the exhibitors sold the goods they had brought to Moscow. (Some observers estimate that almost 20% of the equipment exhibited was produced under license from U.S. companies or by U.S. affiliates.)

According to Russian estimates, contracts signed at the fair provide firm orders worth more than \$28 million. But it's probably safe to say that all the major deals consummated at the fair actually were negotiated earlier.

Several major equipment deals were announced in the course of the

fair. Process industries supplier Vickers Ltd. revealed it had won an \$11.2-million contract to supply a complete plant for producing nylon-6/6 for industrial fabrics. Capacity will exceed 6,000 tons/year of nylon.

The Vickers contract appeared to put a damper on the optimism of Imperial Chemical Industries representatives, who seemed to have hopes in the same area. ICI had the largest display at the exhibition, and laid out a large sum of money to send 130 employees and officials to Moscow. The company is reportedly still negotiating with the Soviets for sale of technological know-how in several fields—an effort under way for many months.

Buy to Sell: Britain has been writing up some substantial equipment orders from Russia for several years. The big question: How much will this volume be expanded? The negotiations between British and Soviet officials that took place during the fair left little room for optimism on the part of the British.

While exuding enthusiasm and goodwill for the British during the show, Soviet officials have taken the line that they can't increase their imports from Britain unless the British in turn increase their purchases from the Soviet Union—specifically, in oil

and oil products, of which the Soviets seem to have a steadily increasing abundance.

This question was the key element in trade talks conducted concurrently at the fair between officials of the Soviet Ministry of Foreign Trade and Reginald Maudling, president of the British Board of Trade.

Maudling reportedly reminded the Soviets that England has an oil surplus of its own (via British companies' Middle East interests), and that in any event the Soviets are running a trade deficit with Britain. Last year Britain bought \$210 million worth of goods from Russia, while Russian purchases from Britain came to only \$103.6 million.

The Soviet trade officials, headed by Foreign Trade Minister Nikolai Patolich, nevertheless pressed for a British agreement to allow Soviet oil to take something like 10-20% of the future increase of the U.K. oil market. Thus, they argued, there need be no cutback on supplies from Britain's regular sources.

The Russians went to great lengths to insist they are not trying to break world market prices. They are quite willing, they said, to sell at the going world price.

The joint communique at the conclusion of the conference said Maud-

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(Bulk prices on request)

INTERNATIONAL

ling "took note" of Soviet interest in oil sales. The question is certain to come up again when British-Soviet trade talks are held in London in October or November. However, it is understood that right now the British have no intention of making any meaningful concessions on this point.

Plenty of Fish: Despite the lack of any breakthrough at the official level, most of the exhibitors at the fair appeared to be going home convinced that the effort and expense of exhibiting in Moscow had been well worth while as a long-term investment.

A machine tool maker's comment was typical: "I don't know much about the trade talks. That's politics and I'm a businessman. I think the Russians will buy from me if they see something they want badly enough."

Nevertheless, it's obvious that unless the Soviets are able to sell more to Britain, or change their policy of limiting gold shipments, there is a natural limit to British-Soviet trade. That means British businessmen can expect to compete harder for about the same slice of business.

Dramatizing the Soviet government's theme that there are other capitalist fish in the sea besides Britain, the Soviet press chose the week of the British fair to announce trade deals with Finland, Italy and Japan.

The Finnish firm Vjartsilja will supply Russia with two highly automated, 350-tons/day paper machines, and several pulp machines.

Italy has several big deals signed with the Soviet Union. The Soviet agency Tekhmashimport has signed a contract with ENI, the Italian government oil trust, for delivery to Russia of complete plants for producing methanol and ammonia. ENI has agreed to buy 800,000 tons of Soviet oil, in addition to the 12 million tons to be delivered to Italy over the next four years under the terms of a contract signed last October.

Italy's biggest chemical producer, Montecatini, has contracted to supply the Soviets with plants for acetylene, ethylene, titanium dioxide and maleic anhydride, as well as equipment for making ammonia and ethylene diamine.

Another Italian firm, Saicci, will supply equipment for a 600-tons/day cellulose plant and a 900-tons/day dye plant. Chatillon has a contract for

equipment to produce high-strength cord. Snam Progetti will deliver automation and remote-control equipment and auxiliary equipment for an oil pipeline under construction in the Soviet Union.

And from Cogis Co., the Soviet Union will buy 18,000 tons of staple fiber and 3,000 tons of rayon this year. In turn, Cogis is buying 5,000 tons of cotton.

These contracts fall within the terms of the trade protocol signed in Moscow last February. On June 7, Russia's Patolichev and Italian Minister Mario Martinelli signed a new four-year trade agreement covering the 1962-65 period. The last four-year agreement still has a year to go.

The new pact calls for a considerable increase in trade between the two countries. In '60 the two-way trade totaled \$200 million. Under the new agreement, it's slated to rise to \$260 million in '62; and to rise each year, hitting \$300 million in '65. Altogether, trade would be boosted 80% over the previous four-year period.

Right now, Russia is running a trade deficit with Italy, as it is with Britain. By the end of '60 Russian exports to Italy totaled \$126.4 million, while Italy's exports to the U.S.S.R. came to only \$78.4 million.

Italy will try to close the gap during the new pact period. Its exports to the Soviet Union are to include \$104 million in chemical industry equipment, \$64 million in pipes and equipment for the oil industry, \$18.4 million in cellulose and paper equipment, 12,500 tons of synthetic rubber, and 760,000 metric tons of metallurgical products.

Russia will supply Italy with 4.3 million metric tons of oil in '62 and the same amount in '63, 4.4 million tons in '64, and 4.5 million tons in '65—reaching about 14% of Italy's total crude imports. The '65 limit was reportedly set by Italy, with Russia pressing to ship 6.5 million tons of crude and 2 million tons of fuel oil in '65.

Italy agreed to purchase only 700,000 metric tons of fuel oil in '65, along with the 4.5 million tons of crude. It will also buy graphite electrodes, pyrites, vodka, caviar, timber, etc.

After signing the trade pact, Patolichev planned to stay in Italy for about 10 days, partly to visit the major

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INTERNATIONAL

industrial concerns in northern Italy. His schedule included Snia Viscosa, Montecatini, Fiat, ENI, and others.

Others, Too: Meanwhile, Russia signed another trade pact with Austria. Russia will deliver hard coal, iron, and manganese ores to Austria, in exchange for rolled ferrous metals.

The Soviet news agency *Tass* also reported that Soviet foreign trade agencies have "lately" purchased from Japan on credit industrial equipment worth \$100 million. "Big orders," *Tass* said, were placed for equipment for several pulp and paper mills, refrigerating and textile plants, and for construction of a series of big tankers and three cargo ships.

And last week, Japan's Toho Trading Co., the giant Mitsui Trading Co.'s proxy firm dealing with the Communist bloc, said that Japan's first volume-export deal in synthetic rubber had been concluded with a Soviet trading agency.

The agreement calls for shipment of 2,000 tons of synthetic rubber in August and September, at about \$444.44/ton, f.o.b. Yokkaichi—20% lower than the regular domestic price, or about the same price of imported SBR.

Japanese producers will apparently make little profit on the new commitment. Japan Synthetic Rubber Co. has cut its domestic price twice recently, but has not been able to meet the import price level and has been operating far below capacity.

Meanwhile, Russia is still talking up trade with the U.S. In an article timed for the Kennedy-Khrushchev meeting in Vienna, the newspaper *Ekonomicheskaya Gazeta*—organ of the Soviet Central Committee—complained that U.S. industrialists could find good markets in the Soviet Union if the official attitude changed. "This would be a great help in overcoming their marketing difficulties arising from the instability of the American economy," it suggested.

Purchases from the U.S. could also help ease some of the bottlenecks developing in the Soviet chemical industry as it strives to meet its current seven-year-plan goal of tripling production value by the end of '65. But with or without such trade, Russia's chemical industry is making progress. During the first two years of the plan (1959-60), 60 new chemical plants started operation, *Pravda* claims.

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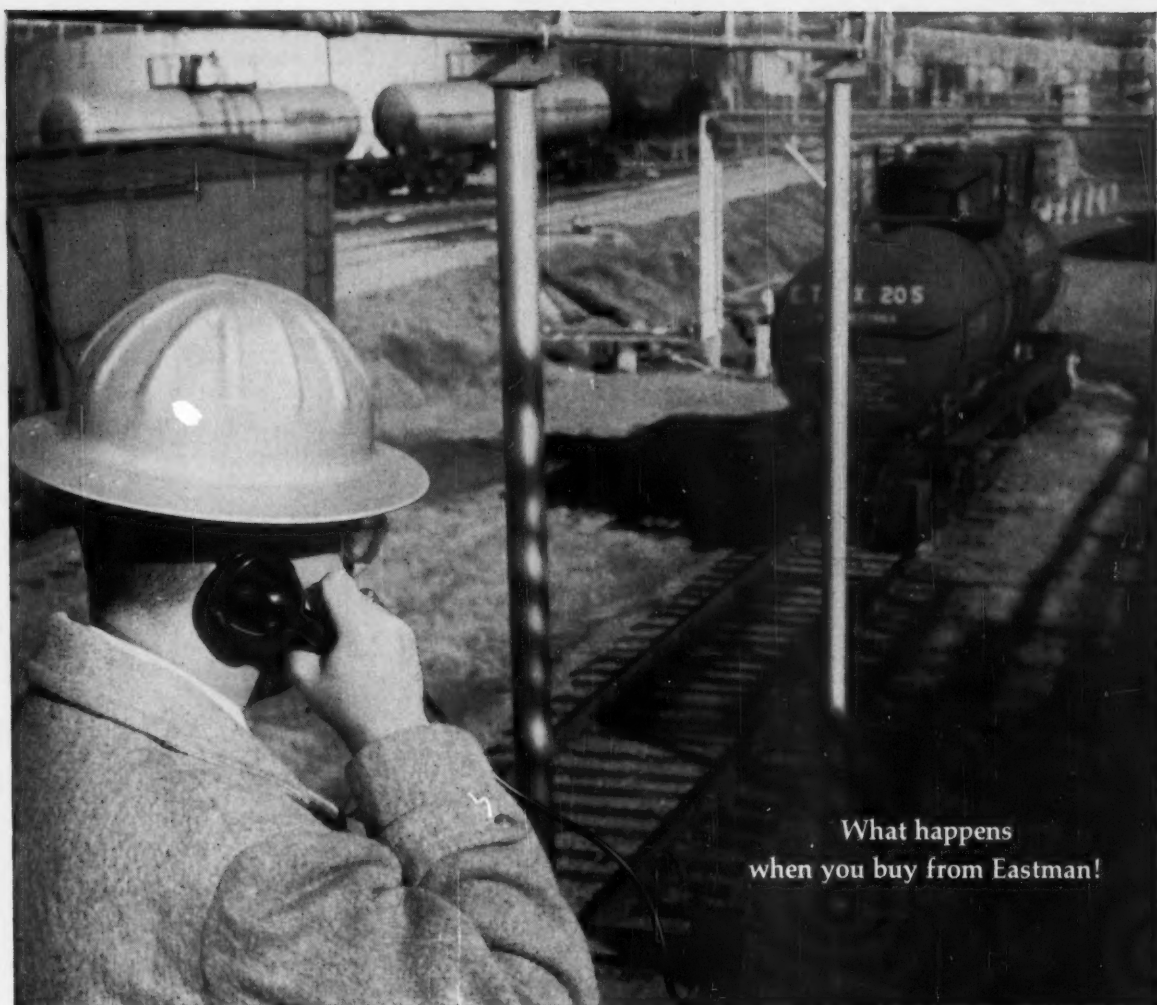
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even originate at our plant. It came from another supplier whom he had been unable to reach by telephone.

"The situation was further complicated by the fact that not only was his unloading foreman off sick but this was the first time they had ever received this particular material. He said he did have a fresh-out-of-college chemical engineer handy, but this young man had assured him that tank car unloading had not been a prerequisite for his degree. I thought maybe I could work it out with him over the telephone anyway, so I asked if

I could talk to the new alumnus.

"Well, I outlined the entire procedure covering everything from foot valves to vent seals. Then he said, 'Would you run that by again?'

"So I did, several times. And about fifteen dollars later we had the tank car hooked up and unloading. And I now know a proud young chemical engineer who could probably unload a tank car blindfolded—because he had to learn it the hard way."

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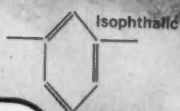
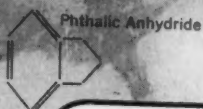


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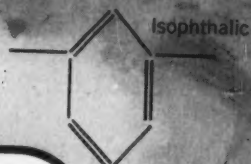
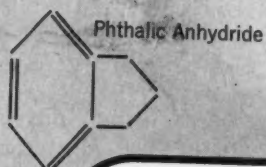
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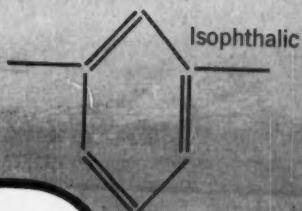
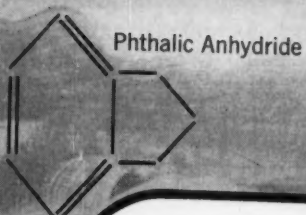
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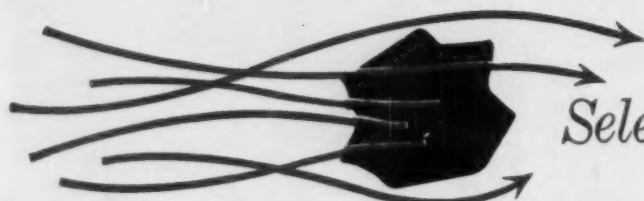



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Selective adsorption...

THE CASE FOR DAVISON SILICA GEL

It's probably a familiar fact to you that Silica Gel is not a "gel" at all, in the usual sense of the word, but a hard tough semi-transparent solid, completely honeycombed with inter-connecting pores of submicron size. This structure provides a tremendous internal surface area accessible to molecules diffusing through the pores.

Consider: One cubic inch of Davison Silica Gel has an adsorptive surface of 90,000 square feet—an area larger than two city blocks. The Silica Gel produced for gas dehydration and hydrocarbon recovery is a typical example. It has an internal surface area of over 800 square meters per gram of desiccant and a total pore volume of .43 cc per gram.

This great adsorptive capacity is what makes Davison Silica Gel a favored desiccant for air and gas dehydration. But today, dehydration of itself is only half the story. These days, Silica Gel is getting more immediate attention because of its *selective* adsorption ability.

What is "Selective Adsorption"?

Every material has some ability to adsorb vapors, but such ability is strictly a matter of degree. Silica Gel, on the other hand, is outstanding in its ability to carry out adsorption *selectively*, while holding a larger quantity of adsorbate per unit area than most other materials. Through the development of specific processes, Davison can manufacture a variety of Silica Gels which can preferentially adsorb one substance over another. Through the years, production reliability has improved to the point where the number of grades of Silica Gel provide a choice for almost every need.

Today, Davison produces some 30 different grades of Silica Gel for an increasing variety of uses. To name a few: *natural gas drying; hydrocarbon recovery; chromatography; catalyst support; recovery of distillate from natural and separator gases; drying liquid petroleum gas; drying air in wind tunnels; keeping precision electronic instruments dry; many forms of packaging where air drying is essential to prevent rust; corrosion, mildew; refrigeration systems; equipment storage, underground gas storage and drying of annealing ovens and blast furnace gases.*

Why Should YOU Consider Davison Silica Gel?

If the above isn't enough to whet your appetite for further data, consider Davison Silica Gel's extremely high purity . . . its higher resistance to fouling and contamination . . . its lower regeneration cost . . . its longer operating cycles in dynamic drying systems.

As America's leading supplier of this selective adsorbent, Davison is ready to apply its knowledge and experience toward helping you exploit the valuable properties of Silica Gel for your own product and profit advantages. In addition, we're deservedly proud of our ability to deliver on time, per your order. Write us today, attention Dept. 3504, or call us any time for technical assistance.

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CW PHOTO—JOAN SYDLOW

TIC's Frankel helping bring technology into the financial world.

Eyeing Ideas for Investment

A new entry in the race to supply money to promising technical firms is Technological Investors Corp. (27 William St., New York). It's headed by Raymond Frankel (above), an MIT-trained chemical engineer, who formerly had charge of special projects for Electric Bond & Share Co. The big edge claimed by TIC: a solid technical background.

The company makes available \$100,000 to \$1 million on an individual investment, also offers technical consultation through a subsidiary, Technological Investors Management Corp.

Technical Staff: Besides President Frankel, two of TIC's four full-time staff members have technological

backgrounds (with extensive business experience as well). Vice-President M. D. (John) Hassialis, a mining and materials chemist and engineer, has been a director of an Atomic Energy Commission laboratory and president of a uranium mining company; and Louis Rosenblum, a mathematician and operations research expert, was formerly with Polaroid, Photon, Inc., and Technical Operations, Inc. Vice-President Nathan Levin has specialized for many years in investment counseling, particularly on new ventures.

Additional business and technical advice is available from two sources: (1) board of directors made up almost entirely of financial professionals; (2) a group of highly competent tech-

nical advisors, including Jesse Hobson, former director of Stanford Research Institute and now an executive with United Fruit; Walter Juda, until recently executive vice-president of Ionics, Inc.; and Walter Baird, president of Baird Atomics. It's the full-time staff, though, that carries on the bulk of the consulting activity.

Looking for Progress: Not content to wait for prospective firms to come forward, Frankel and his associates actively seek out investment opportunities that meet two criteria: (1) the activity must be in an area of technology that has good growth prospects; (2) the prospective company must show special technical competence within that area.

TIC looks for opportunities in such fields as porous materials, electronic microminiaturization, thermoelectric materials and devices, new chemical and metallurgical processes, high-purity materials and special metals. More than 100 such companies have already been checked, although investments have been made in only two: an 18-month-old electronics company and an eight-year-old acoustical firm. In addition, TIC's management subsidiary is selling its services to two other companies.

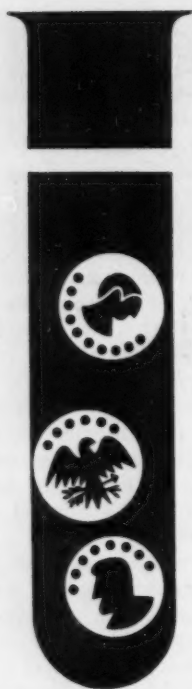
TIC has also been invited to participate jointly with other investment groups in projects those groups have originated, and Frankel hopes that TIC's technical depth will bring it more such offers. Conversely, when the participation by an outside investor in a TIC "find" appears to be justified, it will be arranged.

Other Firms: In its search for promising small companies, TIC finds itself in competition with a host of other firms—e.g., the Small Business Investment Companies that are springing up under the auspices of the Small Business Administration, and well-established American Research and Development Corp. (Boston).

Other sources of venture capital include Laurance Rockefeller and the clients of Andresen & Co. (30 Broad St., New York), an underwriting firm set up last year primarily to represent a select group of investors who offer consulting services as well as capital to new companies (*CW*, May 7, '60, p. 31).

The big advantage held by TIC,

hidden treasure



ORTHO-ANISALDEHYDE...which you may also know as O-Methoxy Benzaldehyde... is one of those little-known, little-discussed chemicals which on first look appears to have very limited application. However, its unusually promising physical properties seem to offer exciting possibilities—especially in organic synthesis or as a pharmaceutical intermediate. ANSUL is in a position to supply it in quantities at an extremely reasonable price. We'd like to work with you in developing additional use information. Write us for samples and complete technical information. ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN.

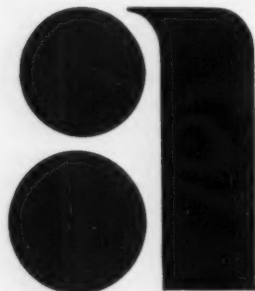
PHYSICAL PROPERTIES

ORTHO-ANISALDEHYDE

MOLECULAR WEIGHT...136.14
BOILING POINT (at 760 mm Hg)...238°C
MELTING POINTS*...(1) 38-39°C
(2) 3°C

SPECIFIC GRAVITY (liquid) 25°/25°...1.1274
SPECIFIC GRAVITY (solid) 25°/25°...1.258
REFRACTIVE INDEX $n_{D,20}$...1.5608
ODOR...Burned, slightly phenolic
SOLUBILITY in H_2O —Slightly soluble
APPEARANCE...White to light tan solid

*Exists in two crystalline forms



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RESEARCH

as Frankel sees it, is its technological staff, made up predominantly of technical people. "It's a case of technology coming into the financial world, instead of the other way around," he says.

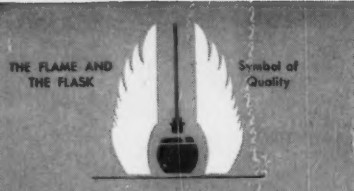
Evidently the era of the new small company that prospers on the basis of a single technological innovation is in full bloom. But the chances that such firms will succeed are still so remote that venture capital will be won only by the most outstanding enterprises, regardless of the variety of financial sources that exist. On the other hand, coupling consulting services with financing means that a prospective firm may be able to get funds without a fully rounded organization—as long as its basic idea is sound.

PRODUCTS

Organic Barium Salts: FMC Corp. (New York) is bringing out developmental quantities of five new organic barium salts: barium phytate, barium sulfostearate, barium benzenesulfonate, barium hydrogen cyanurate and barium dihydrogen cyanurate. Among recommended applications: adhesion and hardness improvers for water-thinned paints; flexibility improvers for solvent-thinned paints; in cutting, metal-working and grinding compounds; as slip agents for polymers. Data sheets on all five are available.

Calibration Chemicals: The National Bureau of Standards (U.S. Dept. of Commerce, Washington 25, D.C.) is now making available eight standard hydrocarbon blends for use in analyzing gasoline and blending stocks. They're mixtures of seven or eight pure hydrocarbons representing C_7 and C_8 paraffins and cycloparaffins found in typical virgin cuts and catalytically cracked naphthas. Primarily, they're intended for calibration of mass spectrometers, but can also be used in infrared and gas chromatography. Each standard sample, containing 10 "one-shot" ampoules, is available for \$12.

Tellurium News: Penn Rare Metals offers semicommercial quantities of tellurium metal and semicommercial lots of four new germanium salts. The metal is 99.9999% pure and is used in preparing thermoelectric and cer-



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But have you noticed that management men in the Chemical Process Industries are beginning to perk up? Haven't some of them mentioned there's new hope for reform... perhaps, even cited the Special Depreciation Report by CHEMICAL WEEK? If you haven't talked to CPI-Management lately, listen to CW's editors...

"Before the 87th Congress goes home this year, it's likely that U.S. industry at long last will get: (1) new tax benefits to spur investment in new plants and equipment; or (2) long advocated further liberalization of depreciation allowances. A combination of both is a distinct possibility and a cheerful prospect for the profit-pinched CPI."

It means as much to you as it does to CW's readers. So why not get a reprint or go back to the March 25th issue and read it. From the task force journalism of this exclusive "Depreciation Report" to the news as it breaks any place, any time in the chemical world... it will show you how CHEMICAL WEEK, uniquely, serves CPI-Management in all functions and on all fronts, and always in balance with its needs. If you want to show management men that you, too, understand their problems, and have possible solutions... put yourself on record in *their* magazine.

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RESEARCH

tain semiconductor compounds.

The new germanium salts, tetrachloride, tetrabromide, tetraiodide and tetrahydride, are used in epitaxial growth. Production capacity currently is about 400 kilograms/month; their introduction doubles the firm's capacity for germanium compounds.

All of Penn Rare Metals' products are sold through Kawecki Chemical (Boyertown, Pa.), 50% owner of the firm's common stock.

• Pilot-plant production of lead telluride is now under way by Semi-Elements, Inc. (Saxonburg, Pa.). It's available for 50¢/gram in kilogram lots or less; larger lots are available at specially quoted prices. Although not the most popular thermal electric compound, lead telluride does find application in thermal electric work. Semi-Elements is studying other tellurides as well.

• **Peptide Former:** Pilot Chemicals, Inc. (Watertown, Mass.), has recently started production of a new peptide-former, N-ethyl-5-phenylisoxazolium-3'-sulfonate. The compound was first synthesized by Robert Woodward and colleagues at Harvard, it's aimed for physiological and enzyme studies. Use of the compound is said to offer several advantages over older methods of preparing peptides. Included: higher yields; ease of removal of by-products by a water wash; a simple and fast reaction at room temperature in a neutral solvent. The product is available in developmental quantities; price and technical data may be obtained on request.

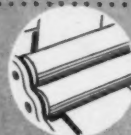
• **Gallium Compound:** Alloys Unlimited Chemicals (Long Island City, N.Y.) is introducing gallium arsenide in single and polycrystal forms for use in diodes and transistors. It's available in varying resistivity ranges for p- and n-type devices, either undoped or doped with zinc, cadmium, manganese, tellurium or tin.

• **Fluoboric Line:** Harstan Chemical Corp. (1247 38th St., Brooklyn) is now offering fluoboric acid and a number of metal fluoborate salts, including tin, lead, copper and nickel.

• **Worm-Fighter:** Merck, Sharp & Dohme Research Laboratories, a division of Merck & Co. (Rahway, N.J.), has developed a new drug, de-

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of inks

GLOSS
of floor waxes



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FINISHING**

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of panned candy



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Out, Out Impurities!

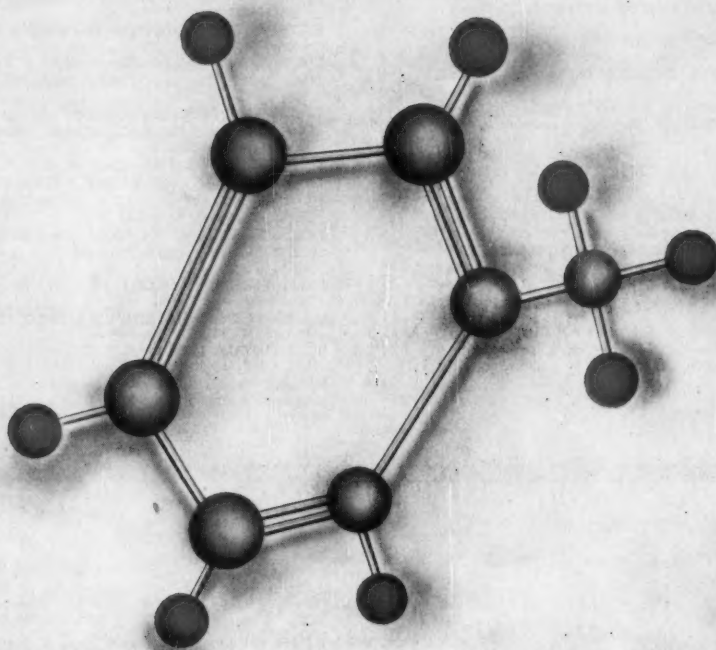
Paraffin and sulphur are undesirables with which we show no tolerance in our Toluene. Through rigid quality control our process engineers have reduced paraffin content to the humble figure of 0.04%. As for sulphur and thiophene they are now undetectable by even the most sensitive test methods. Meanwhile, the Kauri-Butanol value of Delhi Toluene hovers at a whopping 105!

As a solvent or a chemical building block, Delhi Toluene offers the advantages of high purity and uniformity ...backed by dependable service.

Bulk deliveries of Delhi Toluene are efficiently handled from plants and strategically located bulk terminals.

Send for our Petrochemicals File.

TOLUENE



CHEMICAL DIVISION

DELHI-TAYLOR OIL CORPORATION

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CORPUS CHRISTI • CHICAGO • CHARLESTON, S. C. • BATON-ROUGE • HOUSTON

Chemical Week

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4-5800

Cleveland 13 H. J. Sweger Jr., Duncan C. Stephens
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1-7000

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7-9721

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1125 West Sixth St., HUntley 2-5450

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Paul F. McPherson, Charles F. Onasch, L. Charles
Todaro, 500 5th Ave., OXFord 5-5959

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Pittsburgh 22 Duncan C. Stephens
4 Gateway Center, EXpress 1-1314

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Room 445, Pacific Bldg. CAPITAL 3-5118

St. Louis 8 R. J. Clausen
3615 Olive St., Continental Bldg., JEFFerson 5-4867

San Francisco 11 William C. Woolston
255 California St., DOUGlas 2-4600

RESEARCH

scribed as a broad-spectrum anthelmintic. The new agent, thiabendazole, is said to be highly effective against a wide range of gastrointestinal parasites, especially the troublesome roundworm species.

Hafnium Silicide: Experimental quantities of hafnium silicide are available from Electronic Materials Corp. (2200 Colorado Ave., Santa Monica, Calif.). Proposed for use as a hard facing material, the product has a low coefficient of friction, high thermal stability and hardness, and relative ductility. It can be applied by flame or plasma spraying and the firm is working on a direct-weld deposition method.

LITERATURE

• **Communist Chinese Manpower:** "Professional Manpower and Education in Communist China" by Leo A. Orleans, senior research analyst, Library of Commerce, may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. for \$2. Among Orleans' conclusions: China's education setup is undergoing radical change; its scientific effort is geared to meet immediate technological demands; its industrial development is being handicapped by a high-population problem.

• **Handbook of Chemistry:** Norbert Adolph Lange's classic "Handbook of Chemistry" is now out in a new (10th) edition. (McGraw-Hill, New York, N.Y.).

• **Help Toward Research Contracts:** A new, 26-page report ("Federal Agencies Financing Research") is intended to provide a guide toward obtaining government research contracts. It is sold for \$1 by the Social Legislation Information Service, Inc. (Washington 6, D.C.).

• **Fuel Cells:** A bibliography of U.S. fuel cell research is available from the Office of Technical Services (U.S. Dept. of Commerce, Washington 25, D.C.).

• **Sugar Patents:** "Patents on the Reactions of Sugar," a revision of a 1947 booklet of the same title, is available on request from the Sugar Research Foundation (New York). It lists reactions of sugar and invert sugar yielding chemical compounds or resins.

Tracers

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CHEMICAL
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POSITION VACANT

General Production Manager. Excellent opportunity in fast growing aerosol chemical packaging company. Desire person with experience in "high volume" manufacturing. Prefer bottling, canning or other conveyerized experience. Will have complete charge of manufacturing operations. Send full resume to: Puritan Aerosol Corp., 160 Washington St. N., Boston 14, Mass.

Chemists—Organic & paper coating. To develop photo sensitive & other graphic arts products. Westchester location. Benefits. Resume with salary requirements. P-6936, Chemical Week.

Urethane Chemist—Thorough experience in Ester essential for leading Urethane Foam producer. Exceptional opportunity. Complete confidence assured. Full resume, salary, P-6915, Chemical Week.

Sales Manager—\$25,000 to start. AAA1 35 year old firm seeks top flite man to recruit, train, and manage an expanding sales force which will call on distributors of Sanitary Maintenance products used by industry and institutions. Please write to the President. All replies will be treated with utmost confidence. You will be given a personal interview within 2 weeks of our receipt of your reply. P-6919, Chemical Week.

SELLING OPPORTUNITY AVAILABLE

Manufacturer of basic detergents, alkyl aryl sulfonates, alkanolamides, sulfated fatty acid amides seeks agencies throughout the States. RW-6939, Chemical Week.

Manufacturers Reps. to market our complete line of custom-built Vibrating Screen Units throughout U.S.A. We have manufactured Vibr. Units for 23 consec. yrs. Exclusive franchise. Liberal commissions. Furnish complete resume to: Hutchison Mfg. Co., Box 9335, Houston 11, Texas.

POSITION WANTED

Process Control Engineer: B.Chem.Eng. 1950. Enterprising, 10 years instrumentation & control systems experience in chemical industry. Knowledgeable Chemical Process and Instrument Hardware & Theory. Capable organizing Process Instrumentation Group for Chemical or petroleum firm or position with Instrumentation or Systems Engineering firm in this field. Interested in applying new automatic control systems ideas for process efficiency. PW-6935, Chemical Week.

SELLING OPPORTUNITY WANTED

Sales—Distribution—Jobber chemicals wanted for exclusive North Jersey-Metropolitan area by old established chemical company with warehouse, railroad siding, etc. RA-6938, Chemical Week.

Manufacturers Representatives—Dallas based—calling on Missile, Electronic, Municipals and general industry. Selling Epoxy compounds and Protective Coatings. Want new or additional lines. RA-6905, Chemical Week.

PROFESSIONAL SERVICES

Technical Guidance by Martin H. Gurley, Jr., Research Advisory Service, RFD. 4 Lexington, Va. COngress 1-3294.

PROFESSIONAL SERVICES

Consulting chemical engineer in organic chemicals field. Skilled at handling problems in production and process improvement and in economics and plant management. PS-6914, Chemical Week.

CONTRACT WORK WANTED

Custom Grinding—Ultra Fine or Coarse—Specialty or Volume Blending and Grinding service on unit or contract basis. Complete CO₂ installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

BUSINESS OPPORTUNITIES

Chicago Bulk Chemical or Petroleum storage. River front location—railroad spur. Access to tollways—will build to suit. Send for booklet—Hannah Terminals, Box 89, Lemont, Illinois—BI 2-3210.

Chemical Companies! Is your growth limited by the shortage of managerial talent or financing? If so, consider the advantages of combining management and effort with a publicly-held corporation (rated D & B AAA-1) with nationwide operations. Rapidly-growing chemical corporation desires to acquire, by purchase or merger, soundly-managed companies with annual sales volumes of \$200,000.00 or more. Opportunity for present management to insure personal future by association with soundly-financed leader in the field. Address inquiries in strictest confidence to BO-6833, Chemical Week.

EQUIPMENT FOR SALE

Multi-million dollar chemical plant liquidation at North Little Rock, Arkansas. Stainless Steel tanks, heat exchangers, pumps, pipe, valves, etc.; Pfaudler glass-lined kettles & reactors; Worthington #LTC-4 3500 cfm air compressors; Duriron exchangers & columns; Lead-lined tanks, concentrators, etc. Send for detailed circular. Perry, 1415 N. 6th St., Phila. 22, Pa.

Bird 24" x 38" continuous centrifugal, T304 Stainless conical bowl. Perry, 1415 N. 6th St., Phila. 22, Pa.

1350 gal. T347 Stainless tank, 4' x 14', dished heads. ASME code 60 psi WP. 38 sq. ft. internal coils. Perry, 1415 N. 6th St., Phila. 22, Pa.

2000 gal. Glasco blue glass-lined jktd. reactor, ASME 50 psi int., 90 psi jkt. Perry, 1415 N. 6th St., Phila. 22, Pa.

CHEMICALS FOR SALE

Chemical Grade Iron Powder -20 Mesh. Large tonnage available. Contact: Robert Craig, Micro Metals Corp., 99 President St., Passaic, N.J., PRescott 8-6689

EQUIPMENT WANTED

Wanted Autoclave and Filter. Autoclave must be minimum 36" dia., prefer up to 60" dia. Filter must have minimum 50 feet filter area, prefer up to 120 feet, must be aluminum or ss., platen frame type, maximum frame thickness 1". W-6884, Chemical Week.

PLANTS & PROPERTIES

For lease Newark, N. J. 6000 sq. ft. Buildings 2 acres land, 5 car siding, large elec. & gas service, 120,000 gal. tank storage. Unrestricted zone, \$550 per mo. Arco Corp. S. Kearney, N. J. MA 4-1525.

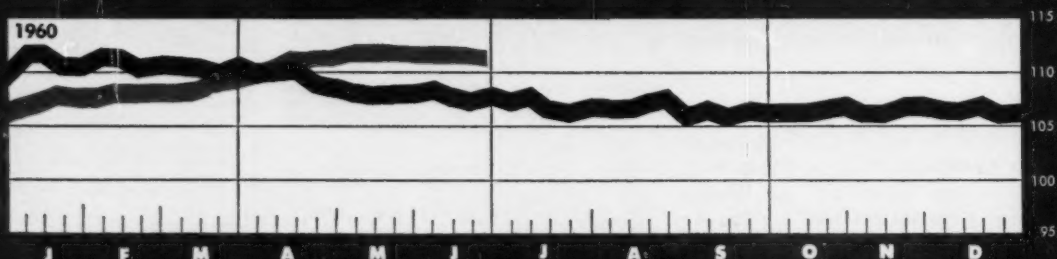
BOOKS

For recovery of precious metals catalysts, solutions send for recovery schedule. Precious Metals Recovery Corp., 85 River Road, Nutley 10, New Jersey.

'51 OUTPUT INDEX



'51 PRICE INDEX



JUNE 24, 1961

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	125.6	125.3	122.4
Chemical Week wholesale price index (1947=100)	111.0	111.8	108.2
Stock price index (12 firms, Standard & Poor's)	54.37	53.97	52.87
Steel ingot output (thousand tons)	2,042	2,052	1,756
Electric power (million kilowatt-hours)	15,004	13,887	14,147
Crude oil and condensate (daily av., thousand bbls.)	7,053	7,060	6,771

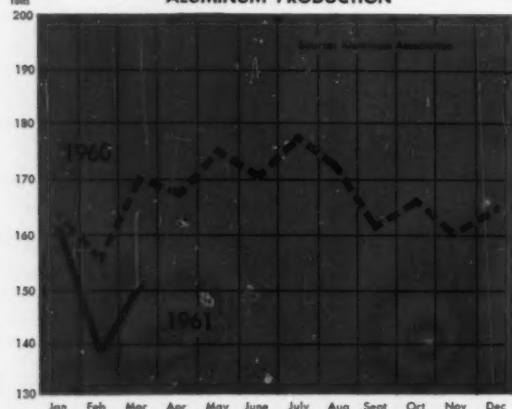
EMPLOYMENT INDICATORS (thousands)

	Latest Month	Preceding Month	Year Ago
All manufacturing	15,476	15,492	16,380
Nondurable goods	6,663	6,690	6,832
Chemicals and allied products	881.8	873.0	882.3
Paper and allied products	547.4	545.4	562.3
Rubber products	239.3	239.4	260.2
Petroleum and coal products	216.5	216.2	232.4

CHEMICAL CUSTOMERS CLOSE-UP

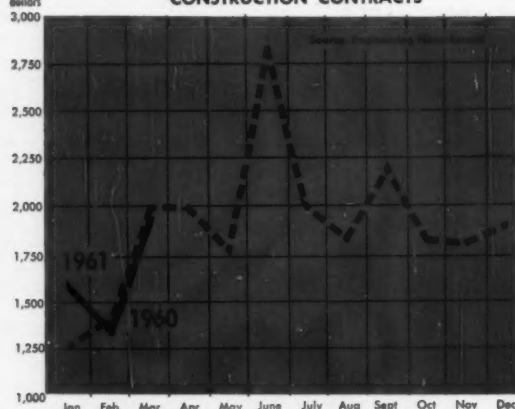
Thousand tons

ALUMINUM PRODUCTION



Million dollars

CONSTRUCTION CONTRACTS



airborne silica.....it's white magic!



CAB-O-SIL®instant gelling agent

- 1) ADD 5.3% Cab-o-sil to turpentine
- 2) SHAKE AND TIP OVER IMMEDIATELY
— gel sets so fast, so firm even a paper clip
is locked tightly in suspension
- 3) SPRAY — gel is sprayable . . .
Cab-o-sil is a thixotropic agent too!

...sustaining agent...thixotropic agent

As this simple test points out, you will find Cab-o-sil, Cabot's new, super-fine airborne silica, both super-fast and super-versatile. Here, for example, it's 3 agents-in-one: gelling agent, suspending agent, and thixotropic agent.

But this kind of "white magic" is just one of many 'miracles' Cab-o-sil is performing these days — and in amazingly minute concentrations. That's because of Cab-o-sil's unique combination of properties, including exceptional purity, enormous

surface area, unprecedented ease of dispersion, freedom from moisture, and unusual optical characteristics . . . properties which make it one of the most versatile raw materials you can use.

Cab-o-sil can be used in all these ways:

■ inert substrate or carrier ■ binding agent ■ thixotropic agent ■ dry grinding agent ■ thickening agent ■ dispersing agent ■ gelling agent ■ buffering agent ■ insulating agent ■ free-flow agent ■ reinforcing agent ■ tableting agent



Minerals & Chemicals Div., CW

CABOT CORPORATION 125 High Street, Boston 10, Mass.

USES:

- Thixotropic, thickening, gelling agent — lubricating oils, greases, polyester resins, epoxy resins, plastisols, plastigels, organosols
- Suspending agent — paints
- Flattening agent — varnishes, lacquers, organosols, plastisols
- Reinforcing agent — rubber, silicone, latex film
- Anticaking agent — sulfur, insecticides
- Antislip agent — solvent-base floor waxes
- Precoating material — reproduction paper
- Low temperature thermal insulation
- Pharmaceuticals and Cosmetics — (See bulletin #cpha-1)

Please send ☐ free Cab-o-sil sample
and other technical data checked

NAME.....

TITLE.....

COMPANY.....

ADDRESS.....

Technical data available:

- () General Properties, Functions and Uses (#cgen-1)
- () Cab-o-sil in Butyl Rubber (#crub-2)
- () Cab-o-sil in Dipped Latex Films (#crub-3)
- () Cab-o-sil in the Lubricating Grease Industry (#cgre-2)
- () Aqueous Dispersions of Cab-o-sil (#cmis-2)
- () A Flattening Agent for Varnishes (#cpai-3)
- () Cab-o-sil in the Reproduction Paper Industry (#cpap-1)
- () Cab-o-sil in the Plastics Industry (#cpla-2)
- () Cab-o-sil in Automobile Polishes (#cpol-1)
- () Cab-o-sil in Pharmaceuticals and Cosmetics (#cpha-1)



Her artificial flowers are alive ...with **TITANOX**

The colors of nature's palette—strong reds, gentle pastels, glistening whites and delicate greens—are reproduced in plastic flowers with the aid of TITANOX white pigments.

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